

THE OFFICIAL

**ARMY  
INFORMATION  
DIGEST**

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MAY 1961

ARMY  
INFORMATION  
DIGEST



THE OFFICIAL MAGAZINE OF  
THE DEPARTMENT OF THE ARMY

The mission of ARMY INFORMATION DIGEST is to keep personnel of the Army aware of trends and developments of professional concern.

The Digest is published under supervision of the Army Chief of Information to provide timely and authoritative information on policies, plans, operations, and technical developments of the Department of the Army to the Active Army, Army National Guard, and Army Reserve. It also serves as a vehicle for timely expression of the views of the Secretary of the Army and the Chief of Staff and assists in the achievement of information objectives of the Army.

Manuscripts on subjects of general interest to Army personnel are invited. Direct communication is authorized to: Editor, Army Information Digest, Cameron Station, Alexandria, Va.

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**COVER:** Knowledge of jungle ways, including techniques of survival and combat in dense rain forests of the tropics, is taught at the Jungle Warfare Training Center—an activity of the U. S. Caribbean Command, described in this issue.

COMMAND LINE

Army Views  
On Vital Issues

ON THE WIDENING SCOPE OF BATTLE

"In developing weapons and equipment for our modern Army, we must take into account the changing nature and dimensions of the modern battlefield. During World War II, for instance, a Field Army covered an area roughly the size of the state of Vermont (9,564 square miles). On the nuclear battlefield, a Field Army could cover an area roughly the size of the combined states of Pennsylvania, Maryland, and Virginia (96,559 square miles).

"Tremendous improvements in firepower, especially gains afforded by surface-to-surface missiles with nuclear warheads, have made one thing certain. We must disperse units and their equipment to a much greater extent than ever before. This must be done to avoid attracting nuclear attack and to lessen the effects of such an attack if it occurs.

"We can foresee many demands on this battlefield. For one thing, units will have to be more self-sufficient than before. For another, we need surface-to-surface missiles with adequate range to reach laterally and in depth for distant enemy targets. And we shall need faster transport of all types to permit units to concentrate speedily in the attack and then disperse before coming under enemy nuclear fire."

*General George H. Decker, Army Chief of Staff,  
at the National Press Club,  
Washington, D. C.*

ON ORDNANCE ACTIVITIES

"Out of every dollar provided to the Army, Ordnance invests approximately 40 cents in design, development, procurement, and maintenance of Army weapons. Currently we spend about 55 percent of the available money for conventional weapons—tanks, combat vehicles, artillery, and small arms—and about 45 percent for rockets and guided missiles. That split must provide the Army with balanced firepower, balance in the kind of weapons, balance in the types of warheads as between nuclear and conventional high explosives."

*Lt. Gen. J. H. Hinrichs, Army Chief of Ordnance,  
before American Ordnance Association,  
Washington, D. C.*

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MAY 1961  
VOLUME 16 NUMBER 5



THROUGHOUT the history of the United States Army, our soldiers have overcome the obstacles of weather and terrain to emerge victorious from battle. This heritage is proudly carried forward at the U. S. Army Jungle Warfare Training Center.

In the jungle the normal problems of visibility, movement, communications, tactics and logistics are magnified. However, they can be overcome by knowledge of jungle ways and by the application of sound battle-tested principles and doctrine.

The greatest obstacle the individual sol-

dier encounters is fear of his surroundings. Self-confidence—inspired by learning and experience—enables him to utilize the jungle as an effective combat ally. The principles and doctrine are not changed—only the technique of their application.

In its Jungle Warfare Training Center the U. S. Army teaches units and individuals the methods considered best to overcome the difficulties of jungle combat.

MAJOR GENERAL T. F. BOGART  
Commanding General,  
U. S. Army, Caribbean

**Before coming to grips with the enemy,  
the soldier must first overcome  
and then ally himself with**

# **The Jungle: Neutral Adversary**

**Lieutenant Colonel John E. Goldoni**

**I**N THIS ERA when global tensions threaten to erupt in any number of world trouble spots, the U. S. soldier must be ready for instant deployment anywhere, anytime. As the U. S. Army learned in combat operations in the Pacific, on the mainland of Asia and in the jungles of Burma during World War II, its troops must be prepared to close with and destroy the enemy under all conditions of climate

**LIEUTENANT COLONEL JOHN E. GOLDONI, Infantry, is Commanding Officer, U. S. Army Jungle Warfare Training Center.**

and terrain—including the most forbidding jungle areas.

In April 1951, the Department of the Army assigned the U. S. Army Caribbean the mission of "keeping the art of jungle warfare alive" by maintaining a cadre of jungle fighters, trained and ready, should the need for their services ever arise.

This mission is accomplished daily by a group of officers and men at the U. S. Army Jungle Warfare Training Center, Fort Sherman, Canal Zone. The unit, known locally as JWTC,



Behind the Jungle Warfare Training Center at Fort Sherman stretches dense, rank growth, 55 square miles of which are given over to the actual training area.

conducts jungle warfare training, develops and tests jungle doctrine and techniques, and tests such equipment as may be requested by chiefs of the Technical Services and the U. S. Continental Army Command.

In addition, JWTC conducts a three-week training cycle which is presented ten times annually. The training is based on three important lessons learned in actual combat—

- Jungle warfare places an extreme demand for physical fitness, endurance and resourcefulness on the individual soldier.

- Combat in the jungle is a series of rapid, close engagements where an infantryman's life depends upon his speed, skill and cunning. Many times his leaders are too far away to control his action. Individual action therefore becomes decisive.

- The jungle lends itself to infiltration, making rear areas susceptible to attack at any time. There are no "non-combatants" in the jungle.

### Conditioning the Trainee

THE three-week, 210-hour program of instruction at the Center is designed to prepare individuals and small units physically and mentally for operations in any jungle area of the world. Training of the individual in specific tasks accounts for two-thirds of a student's time at the school. This specialized training is based upon the assumption that all students have completed advanced unit training.

The first day of training begins with the assumption that the new student knows little about the jungle, that his previous exposure has been limited to Tarzan movies and that he has an inherent fear that every foot of travel through the bush will be marked by the peril of snakes, alligators and wild animals. Accordingly, the first objective is to condition the soldier psychologically to the reality that the jungle is *neutral* and that, with the confidence born of knowledge and

experience, he can make it a valuable ally instead of an adversary.

Aided by nature and the U. S. Army, Fort Sherman provides 55 square miles of classic jungle terrain. The training area is characterized by a hot humid climate and heavy rainfall, coupled with landforms consisting of many rapidly flowing streams and rivers, hills, ridges and valleys. The entire reservation is dominated by three general types of vegetation —swamp forest, upland forest and savannah grassland. Many additional variations are used to advantage in orienting the infantryman on how jungles affect military operations.

Initially, the student becomes aware, through personal experience, of the effects of heat on man in the tropics. He soon learns that sufficient salt and ample quantities of water will prevent most heat casualties. During this same period the novice jungle fighter is introduced to a variety of edible fruits and plant life found in the jungles of Central America. He is taught to distinguish between poisonous and medicinal plants and instructed in methods of food preparation.

The final step in the psychological assault on the student's fear of the jungle occurs when he is confronted with a variety of snakes and animals indigenous to the jungles of Panama. Instruction in methods of hunting, trapping, handling and preparing these animals for consumption is rounded out with a tour of the JWTC prize possession, its zoo. Containing many reptiles and animals, this facility is reputed to have one of the most representative groupings of jungle wildlife in Latin America.

The student is then armed and trained with the jungle fighter's most effective weapon, the machete. He is

instructed in its use both as a tool of silent death and a tool of survival.

### Progress in Proficiency

ON THE second day, the student moves into the jungle to take up more serious training. Using only natural jungle materials, he constructs a typical jungle bivouac. Here his artfulness and industry pay off since this will be his home during the first week of training. Having mastered the problem of shelter, the student is then required to test his culinary ability by preparing a dinner from scratch, using animals he has killed and edible jungle foods.

At this stage, the average soldier has overcome his initial fear of the jungle and is usually prepared to face the obstacles he will encounter during jungle operations. He is instructed in the techniques of cliff climbing, rappelling, expedient stream crossing, rope traverse and bridging. The student also builds a brush raft and rounds off a strenuous day of activity by swimming across the Chagres River, historic waterway of Panama, once known as Rio Lagartos, or "River of Alligators."



Using his trusty machete, student learns how to live off the land. Here he obtains fresh water from a vine.



Fear of jungle wildlife is overcome by students who learn to work with snakes and other animals in School zoo.

On the fourth day, the trainee is "on his own." He is sent out on a timed compass march to traverse between four and five thousand yards of virgin jungle. During this phase, he becomes aware of the need for navigational ability in the jungle—a feat ordinarily difficult and hazardous for the untrained.

Finally, a timed night cross-country march completes his navigation training. While the distance is less, the challenge of darkness and terrain taxes the best of soldiers.

The fifth day starts with the sharpening of personal fighting skill in preparation for jungle combat. The

soldier begins by walking a jungle trail armed with a carbine, instructed to shoot at any and all silhouette targets that appear. In the close confines of the jungle where the enemy may move within five yards of a position without being observed, the walk becomes a trial of survival. Long forgotten senses of hearing and peripheral vision come into play in stalking "the most dangerous game." This course, commonly referred to as "Quick Fire," develops the student as a proficient jungle fighter.

On the sixth, seventh, and eighth days, the individual tests his recently acquired knowledge during assignments as a member of a reconnaissance, combat and ambush patrol. He practices habits of silent march, track covering, infiltration and column deployment which spell survival for the jungle fighter. His most annoying enemy is not the jungle, heat, or insects, but alert aggressor forces acting as jungle raiders.

On the ninth day of training, the student is confronted with an individual reaction test which demands the use of every skill he has acquired to date. Its successful completion is a



Men position weapons with great care to insure effectiveness and safety when firing through jungle growth.

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Proper knot tying and other rope uses are a must for students who will encounter varied jungle obstacles.



good indication that he has attained the required proficiency in personal jungle combat.

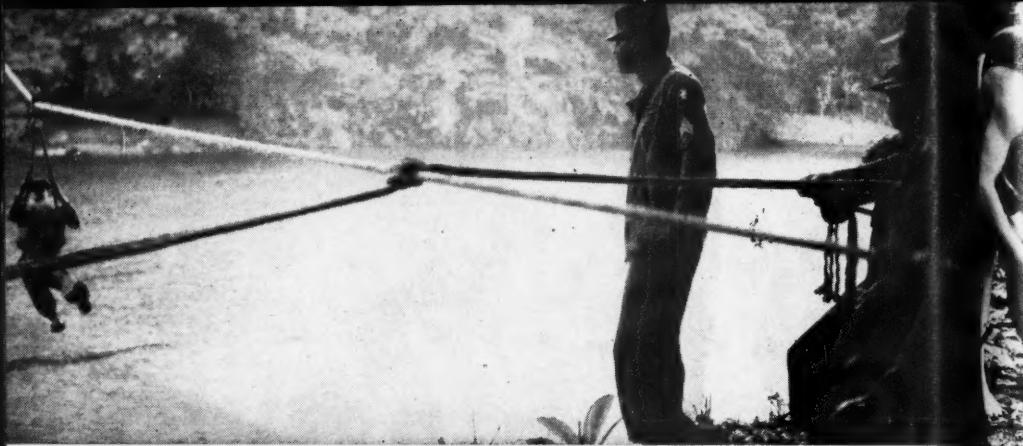
#### Unit Phase

THE school also is organized to train units as well as volunteers. Unit operations are conducted during the tenth to thirteenth days. Here units are briefed for an attack and defense problem to include preparing and ex-

ecuting a night river crossing, organizing a forward jungle perimeter, a night withdrawal and an attack on a strongly fortified aggressor position. During the exercise, the unit commander and his subordinate leaders are confronted with tactical and logistical problems similar to those encountered in actual jungle operations. The effectiveness of this training is apparent in the cohesiveness developed

Taking nothing for granted in jungle warfare, student searches for booby-traps as he encounters "body" of aggressor during reaction phase of performance test.





Ropes are a soldier's best friend in the jungle, students soon learn. They are used to cross rivers, as shown above and left, or . . .



. . . to rappel down steep terrain or to negotiate the slippery rocks of a torrential waterfall.





Self-constructed raft made of brush covered with poncho keeps ammunition, clothing, other equipment dry as soldier swims across a water barrier.

by units operating in the jungle for the first time.

For volunteers, a second approach to jungle operations is provided. Leaders are picked from the senior members in the class and they, in turn, organize the students for raiding missions. The leaders are then briefed on a long-range penetration mission which includes night infiltration of an enemy-held river line, attack and destruction of an aggressor guerrilla camp, and successful linking up with friendly forces. The students are thus faced with the same problems confronting any unit commander magnified by the need for team play in a newly formed organization. The many problems of jungle tactics and logistics are clearly and effectively demonstrated.

On the fourteenth day, the school again puts the individual on his mettle. Either during the attack and defense problem, or on a raid when the student is subjected to psychological

and physical conditions similar to actual combat, he is overwhelmed by the aggressor. Already physically and mentally exhausted, he must escape and evade, continuing to fight the aggressor, the climate and the terrain all the way back to friendly lines.

### The Challenge

THE jungle is a challenge to the professional soldier. It awaits your curiosity. It will make you sick with the heat and tired of the rain. You will be bruised and cut by vegetation, bitten by insects and frightened by the weirdest of noises. The swamps and hills will make you footsore and the rivers and streams will test your mettle. In the end, you will be fascinated by the deep-green solitude and the realization that the jungle is neutral—an element to be met and mastered with the help of the knowledge and training imparted at the School. The skills developed here will serve you anytime, should you meet again.

**The U.S. Army Signal Corps  
reaches new dimensions through**



**W**ITH the dawn of the Space Age, a tremendous new dimension has been added to man's earthly existence.

Arrival of the Space Age can be said to date from man's first contact with the moon, which was achieved by Army Signal Corps engineers at Belmar, New Jersey, in the Evans Area of sprawling Fort Monmouth on 10 January 1946. Known as Project Diana, this achievement represented

a real scientific breakthrough and gave strong impetus to further electronics research activities in space.

Since then, despite the high costs and the superhuman effort required, the national space effort has proceeded on a broad scale for reasons variously ascribed to man's consummate thirst for greater knowledge, to a desire for scientific advancement, and to the requirements of national



## Major General R. T. Nelson

defense and even national survival.

Whatever the motives, United States progress in the mastery of space has been substantial and of far-reaching significance—of much greater significance than is generally realized. The U. S. Army Signal Corps is proud to have had an essential part in it.

Why is the Army Signal Corps interested in space?

For some quite practical reasons, this interest is intimately related to the Signal Corps mission and the role of the Army in national defense. The Signal Corps is the Army's combat arm of command control. Also a technical service, it has the mission of providing the means of command control. This means communications, the transmission of intelligence of all kinds, and the acquisition of intelligence through combat surveillance and target identification.

In effect, the Signal Corps comprises the nervous system of the Army. The provision of various means of communication, combat surveillance, and target acquisition is inseparable from research in many scientific areas. Consequently, the Corps has had to delve deeply into studies of physics, materials, power

sources, meteorology, electromagnetic wave propagation and other aspects of the world of science.

### Army Requirements

IN seeking to provide communications support to Army units and elements deployed throughout the world—in 70 different countries—there is an implacable need for global communications facilities of ever greater capacity, reliability, and speed.

By far the most promising solution to the Army's growing communications problem lies in the tremendous possibilities offered by satellites for the relay of encoded audio and even video communications. While they will probably never replace all of the various existing systems, ultimately they will provide a reliable and efficient means of spanning the oceans and polar regions where today many reliability problems exist. They give promise of greatly increased traffic capacity which would relieve the congestion on existing facilities.

Along with other new developments, satellites also give promise of greater speed in communications service—speed closely approaching the real-time, user-to-user transmission

## **Signals in Space**

which would be particularly advantageous. Undoubtedly, satellites will ultimately provide truly global communications for both military and commercial purposes.

Step by step, the necessary technology for exploring the possibilities of and exploiting the opportunities for space communications has been developed by the Army Signal Corps or by private enterprise laboratories. Many of the really significant technological advancements—in the development of new materials, new techniques of miniaturization and micro-miniaturization, new power sources; and in the exploratory research of such areas as solid-state sciences, nuclear physics, plasma physics, mathematics—cannot compete with the “big bang” or the “flaming launch” when it comes to newspaper headlines. This, however, in no way detracts from their significance or essentiality.

Miniaturization techniques developed by the Signal Corps have contributed immeasurably to reduction in necessary missile-vehicle sizes or conversely to increase in the capabilities of the payload that can be carried by a vehicle of a given size. Printed circuit techniques developed in 1949 and combined with the transistor and other miniaturized components permitted the initial development of systems having a parts density of the order of 50,000 per cubic foot and point to further potentials of 250,000 parts per cubic foot or more. Today,

with solid state circuitry technique, our researchers are thinking in terms of density possibilities of more than a million parts per cubic foot. (See “Light, Compact, Reliable,” September 1960 DIGEST.)

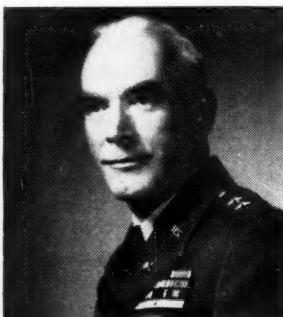
New special and heat-resisting materials developed by the Signal Corps have likewise contributed to the effective design and operation of the vehicles themselves and of the satellites in their space environment.

### **Early Efforts in Space**

WHILE Signal Corps research and development has contributed much to the development of the missile-vehicles by which satellites are launched, its areas of greatest achievement lie in the sophisticated utilization and the developed capability of the satellite in orbit. This is all the more significant since a mere piece of hardware, orbiting in space without some intelligent application, is of little profit except for the boost in morale of the launching personnel.

The Signal Corps, in a sense, is a “hitchhiker” on missile-vehicles provided by others, but it has earned the ride because of its contributions to development of the vehicles themselves and because of its capability for intelligent employment of the satellite in its orbit-destination.

In the dramatic Diana project of 10 January 1946, Signal Corps engineers, using a modified SCR-271 long-range radar, succeeded in bouncing



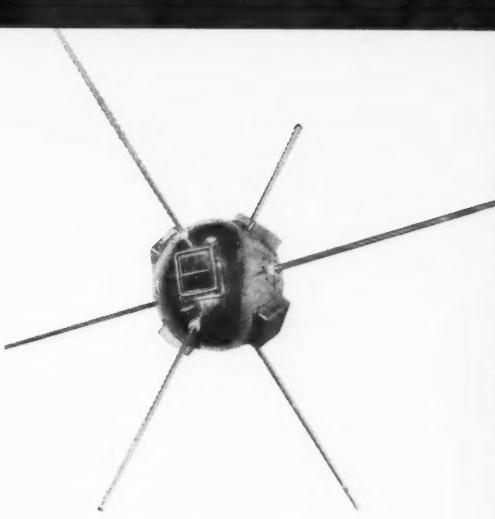
**Major General R. T. Nelson**  
**Chief Signal Officer, U. S. Army**

its radar signals off the moon and receiving them on earth seconds later. The equipment used for the moon contact was an adaptation of an older radar set designed for early warning of enemy air attack. The contact demonstrated that very high frequency radio waves can penetrate the electrically charged ionosphere around the earth and proved the feasibility of space communications.\*

Following the success of the Diana moon-bounce, Signal Corps activities relating to space began to broaden considerably. Renewed emphasis was placed on meteorology. In 1948, new radar equipment at Fort Monmouth observed a rain storm at a distance

\*The use of such missiles as the V-2 rocket during World War II had made the question of propagation of radio signals through long vertical paths in the earth's atmosphere very important. The moon, being well outside the atmosphere of Earth, made a convenient reflector for radio signals passing through the atmosphere and back to a point where they could be recorded and measured.

Man's first contact with moon came when giant 50-foot Diana radar "dish" sent signals to bounce off earth's satellite.



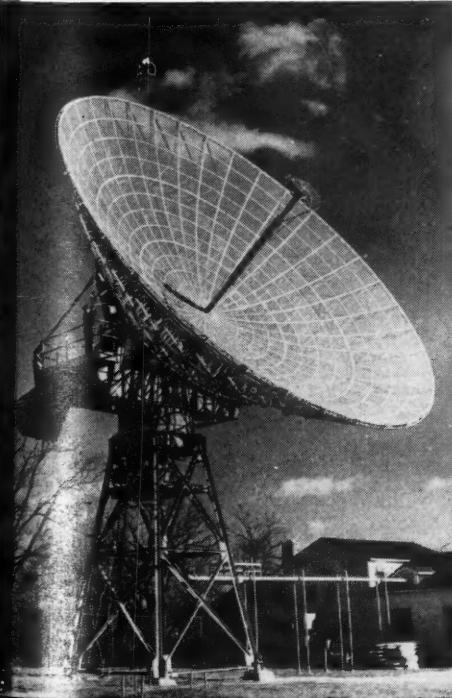
Army-developed solar converters on Vanguard I exterior have sustained continued radio operation for three years.

of 185 miles and then tracked the disturbance to zero range, giving accurate precipitation forecasts for various areas down to the minute. This equipment, or some modification of it, is now in wide use in the military services and the Weather Bureau.

During this time also, Signal Corps weather experts started looking higher, using V-2 rockets at first, and later cheaper carriers for probing temperatures, wind direction, and velocity up to 250,000 feet.

Techniques were further developed and extended during the 1957-58 International Geophysical Year (IGY) to widely separated spot-checks of the high altitude mass currents which spawn our weather. Using specially equipped Aerobee rockets, air currents were thoroughly explored at altitudes up to 80 miles. (See "Pioneering in IGY Research," March 1960 DIGEST.)

On another front, shortly after the Diana moon-bounce, Signal Corps scientists and engineers began participating in post-war atomic bomb tests. These experiments resulted in major contributions to long-range detection of high-energy explosions, new dosimeters, tracking of radioactive



## **Signals in Space**

clouds, and determination of vulnerability of electronic equipment in highly radioactive environments.

Electronic support for guided missiles began in 1949 at the Army's White Sands Missile Range, New Mexico, and soon grew into the large U. S. Army Signal Missile Support Agency. Experience and early participation in this phase of communications-electronics enabled the Army Signal Corps to provide major science and electronics support to subsequent missile and space programs.

The advent and rapid development of Army missiles also brought forth a relatively new and expanding electronics mission area for the Signal Corps—that of combat surveillance and target acquisition. Essentially this involves gathering information day and night, in all weather, about the enemy, for employment of weapons systems against him. In support of this mission, research and development effort was intensified and expanded to include, among other things, a variety of such sensors as radar, photographic, TV, infra-red, seismic, and acoustic devices.

Permeating all such research is the ever-nagging requirement for certain scarce strategic materials. Significant Signal Corps solutions to some of these problems included learning how to grow synthetic mica in 1946, large quartz crystals in 1950-51, and how to synthesize diamonds in 1959.

A rare material, gallium phosphide, grown in Signal laboratories, has been used to build an electronic diode which has withstood temperatures seven times higher than materials previously used. Still under evaluation and study, gallium phosphide holds promise of helping to solve heat-barrier problems encountered by electronic parts in missile nose cones.

Use of a synthetic ruby in the development of a new "electronic ear" has given the Corps one of the most sensitive listening devices invented to date—one that can detect "beeps"

from space vehicles millions of miles away and pick up signals from distant stars.

Signal Corps patience and perseverance in these many areas related to space research have paid off handsomely, and have steadily advanced the national space effort to dramatic levels of sophisticated scientific achievement.

### **Solar Cell Power**

THE Vanguard I satellite, launched on 17 March 1958 under Navy direction, is still sending signals from outer space, courtesy of Signal Corps-developed solar converters for powering its radio transmitter. With little perceptible loss of power, these radio signals have continued to come in as regularly as clock-work and almost as strong as when first launched. On its third anniversary this year, Vanguard I had completed approximately 11,750 orbits, and traveled 408,004,164 miles through space. It is now expected that its solar cells will permit continuous and effective radio signals to earth for several lifetimes.

Vanguard I marked the first use of solar cell power in a satellite by anyone, anywhere. Because of continued success in this first application by the Army, solar cells have been employed in numerous succeeding satellites. As of 1 January 1961, the seven satellites that were still orbiting and transmitting were all of American manufacture. The continuous supply of significant data provided by the tiny Vanguard I, initially referred to with some derision as the "grapefruit" satellite, has caused many knowledgeable scientists to pause in respect.

The development of solar cells for converting sunlight into electrical power is but one area in which the Army has pioneered in the search for dependable power sources, but it is one of far-reaching implications—for both ground and space operations. Other developments particularly applicable to missiles and satellites

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include special chemical batteries of various types.

### Communications in Space

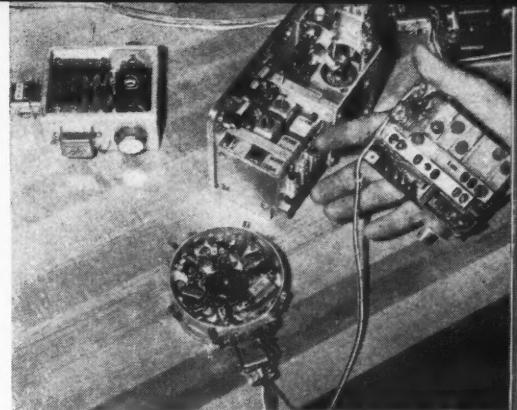
EARLY attempts to transmit radio messages by "lunar reflection"—after the Army's first contact with the moon—always came back scrambled. However, techniques for transmission of intelligible messages were eventually perfected by the Navy.

These were followed by the successful Army Signal Corps development of the communications "package" for the Project SCORE satellite. Launched into orbit on 18 December 1958, the SCORE satellite made possible relay of the first message from outer space—a Christmas message to the world from President Eisenhower.

The communications "package" of Project SCORE—meaning Signal Communications by Orbiting Relay Equipment—was developed by the Army Signal Corps Research and Development Laboratory in cooperation with industry and under jurisdiction of the Advanced Research Projects Agency of the Department of Defense.

Project SCORE demonstrated for the first time that voice, teletypewriter, and even multiple teletypewriter signals could be received, stored, and then retransmitted by a satellite orbiting in space. This satellite was used successfully as both a delayed repeater and as a real-time relay station. To obtain stored messages from the communications relay, a ground station triggered the relay transmitter by electronic command. As long as the satellite was in range, the ground station could also transmit its own message by relay directly to another station. Messages could be relayed from one station to another without storage.

Installed inside the Atlas, using the missile itself as the carrier, the relay consisted primarily of two transmitters, two receivers, and two recorders using erasable loops of magnetic tape. The total payload, including antennas, was about 150 pounds. The trans-



Communications relay system in Score satellite resulted in relaying first message to the world from outer space.

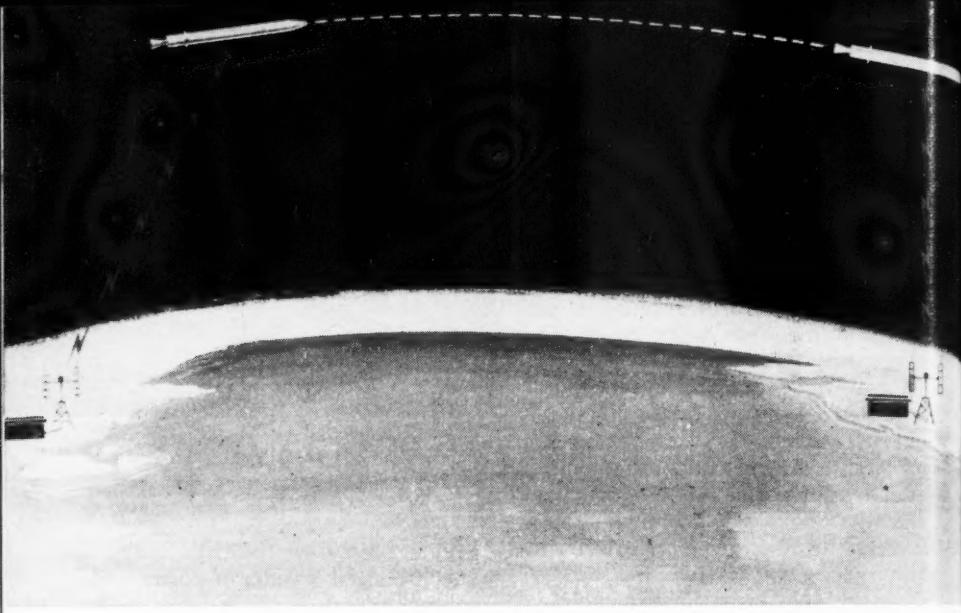
mitter produced 8 watts of power and used zinc-silver oxide batteries with an estimated life of four to six weeks. Solar cells were not used, as in Vanguard I, because of the expected short life of the huge Atlas satellite in orbit.

### Cloud Cover Studies

GLOBAL meteorological research took a giant step forward, and upward, with the launching of the Vanguard II, or United States Cloud Cover Satellite, on 17 February 1959. Equipped with a revolutionary type of meteorological observation and reporting system, the electronic instruments arranged inside the satellite shell were designed and built by Army scientists and engineers at the U. S. Army Signal Research and Development Laboratory, Fort Monmouth, New Jersey.

The satellite's "eyes" were two photocells placed on opposite sides of the sphere to scan the earth's surface and cloud systems from vantage points as far out as 2,000 miles in space. These were so mounted behind circular gridded windows that direct sunlight would not reach them and so that one optic would always sweep the earth.

As the satellite orbited, the photocells scanned the light and dark areas—*i.e.*, clouds and ground—converting



Score satellite was used both as a delay repeater, with messages sent back to a distant station, and as "real-time" relay station sending directly to destination.

the changes in light intensity into electric signals. These signals were recorded on erasable magnetic tape and transmitted to ground stations upon demand, thus re-creating a pattern of light corresponding to the top surface of the cloud areas over which the satellite passed.

Because of its orbit, about 25 percent of the earth's surface could be observed. Prior to this time regular observations had been made of only five to ten percent of the surface.

A series of photographs of areas 300 miles square presented data that made possible a graphic representation of the clouds and weather over a given area of operation. The purpose of this experiment was to give Signal Corps physicists an opportunity to study dynamic cloud systems and to detect and track the early development of cyclonic systems, including hurricanes and typhoons.

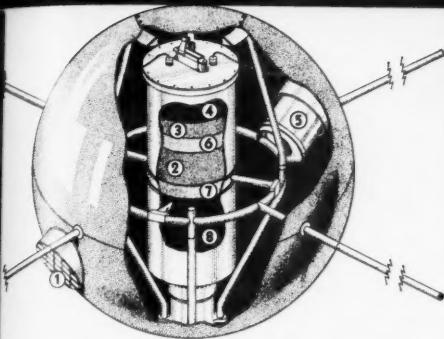
The tape recorder stored about 50 minutes of data and then transmitted it on command in one 60-second burst. Powered with mercury cells

with a life expectancy of only two weeks, the "package" included a solar cell-operated switch which halted the tape when the satellite was in the earth's shadow, thus saving battery power.

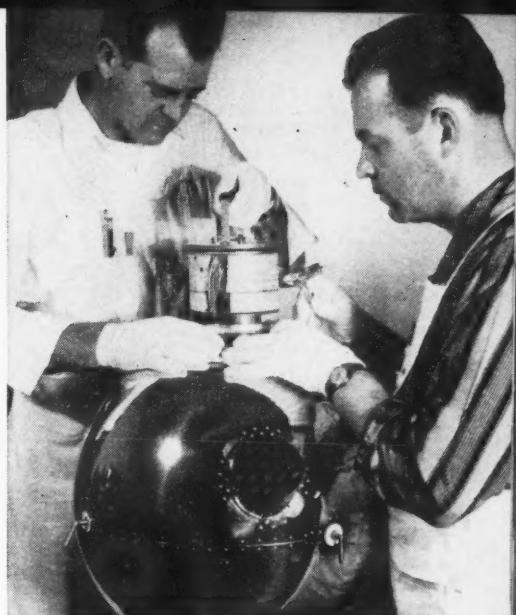
When transmission stopped on 7 March, after approximately 18 days, the satellite had been successfully interrogated 152 times on 211 trips around the earth. The tape recorder and solar switch worked perfectly. Temperature of the satellite was within *one degree* of its thermal design value.

As a first and limited effort to explore the use of satellites for meteorological studies, Vanguard II—a project of the National Aeronautics and Space Administration—performed a very useful purpose. A wealth of intelligence was provided by an electronic package weighing 12 pounds, eight pounds of which were batteries. Total weight of the 20-inch diameter satellite was 21.5 pounds.

A later satellite of this type, known as Tiros I (Television Infra-Red



Weather scanning package is installed in Vanguard II. Sketch above shows (1) photocell light shield, (2) recorder, (3) interrogation radio receiver, (4) meteorological data transmitter, (5) photocell, (6) data electronics, (7) tracking transmitter, (8) mercury cell batteries.



Observation Satellite) was launched on 1 April 1960, also under sponsorship of NASA. In its nearly three months in orbit, it took approximately 23,000 useful photographs of the earth and its cloud cover from vantage points ranging from 430 to 467 miles in space and relayed them back to earth. The instrumentation which made this feat possible was developed under technical direction of the U. S. Army Signal Corps by the Radio Corporation of America.

Tiros I, weighing 270 pounds, was equipped with two television cameras to photograph the earth's changing cloud patterns—one for large area photographs giving an 850-mile square view and another for pinpointing smaller sections about 80 miles on each side. Both provided meteorologists with detailed pictures of hurricanes and cyclonic patterns, with resolution roughly comparable to commercial television. (See "TV Eyes on the World's Weather," June 1960 DIGEST.)

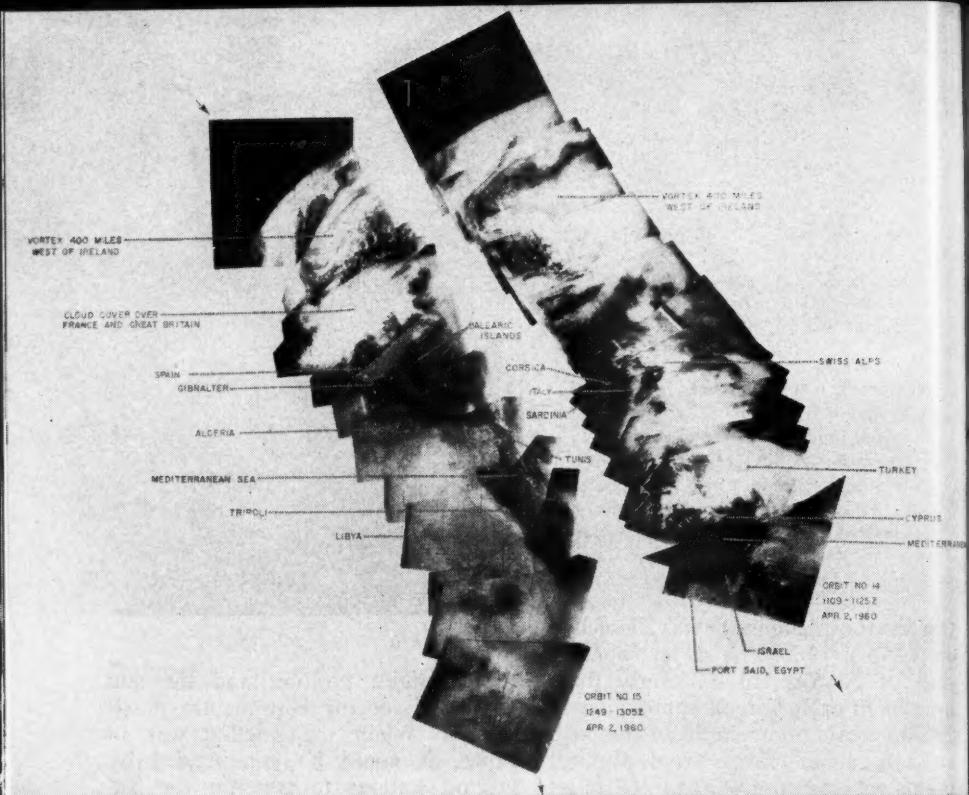
Information gathered by the two TV cameras was stored on magnetic tape in the satellite and then fed, on radio command, to ground stations. These stations could order photographs three orbits in advance, when

the satellite's position and the sun combined for the best picture possibilities. When the satellite was in range, it could be commanded by ground stations to transmit the TV picture of the moment directly to earth, without being taped.

Shaped like a round pillbox, Ticos I was 42 inches in diameter and 19 inches high. Electrical power was provided by banks of 9200 solar cells, which operated directly when the vehicle was in the sun and also charged lightweight storage batteries to provide power when it was in the earth's shadow.

An entirely new design of spin control, similar to a gyroscope, was installed to prevent any wobbling such as experienced in Vanguard II. However, in its later stages, management of the attitude of Ticos I caused difficulties because of a gradual attitude shift traceable to influence of the earth's magnetic field.

Techniques for counteracting this earth magnetic influence were developed by RCA engineers for Ticos II, launched 23 November 1960. Ticos II also incorporated infra-red sensors, omitted from Ticos I, for mapping



Long-range weather forecasters use mosaic photos like these made by Tiros I showing storm area west of Ireland from two different points over Europe and Africa.

relative temperatures of the earth's surface.

Malfunctioning of the wide-angle TV camera in Tiros II caused disappointments from a reliability standpoint—particularly since this equipment had worked well in Tiros I. Overall, however, the innovations in weather satellite techniques proved in Tiros II represented an important advance in general technological capability over Tiros I.

#### Communications Satellites

IN THE meantime, communications satellite projects known as Courier and Advent were set in motion, with management responsibility for both eventually assigned to the Army.

The first into orbit was Courier 1B,

launched by an Air Force Thor-Able-Star missile from Cape Canaveral on 4 October 1960. Army Signal Corps had responsibility for technical direction of the satellite system development and operation of the two ground stations.

Courier was an experimental research and development vehicle designed to explore the feasibility of providing a delayed repeater satellite at a 640 mile altitude. As a delayed repeater, it stored information until commanded to transmit rather than relaying it directly.

Satellites of this type can be envisioned as a messenger system providing a trunking capability for storing and forwarding messages in an eventual worldwide network of orbiting satellites. Like the Score equip-

ment, it could also relay directly between ground stations when both were in range of the satellite.

The remarkable ability of Courier to send approximately 68,000 words a minute, and to receive and store the same amount simultaneously, has been amply demonstrated. Staying within operable range of a ground station for a five-minute period, it was capable of transmitting approximately 340,000 words each way on a single pass—while moving through space at 24,000 feet per second. This wordage is equivalent to approximately three novels.

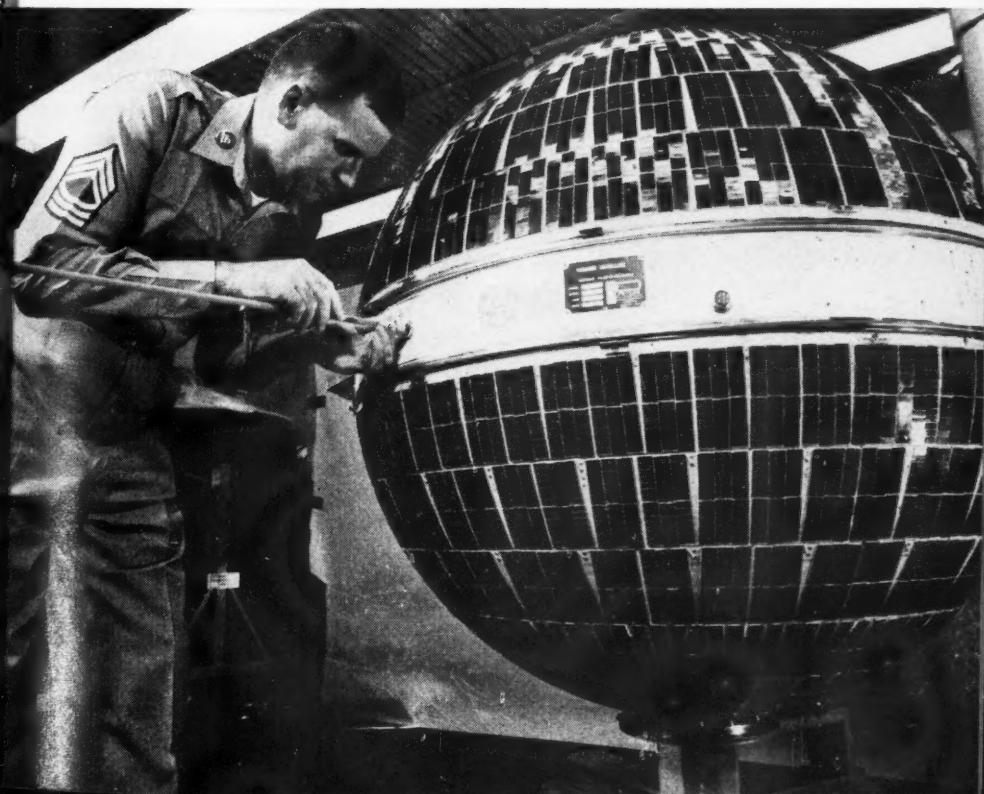
Circling the globe nearly 14 times a day, it exchanged an average total of some 6,000,000 words a day with its two ground stations at Fort Monmouth, New Jersey, and Salinas, Puerto Rico. Both stations also sent and received 60 facsimile photo-

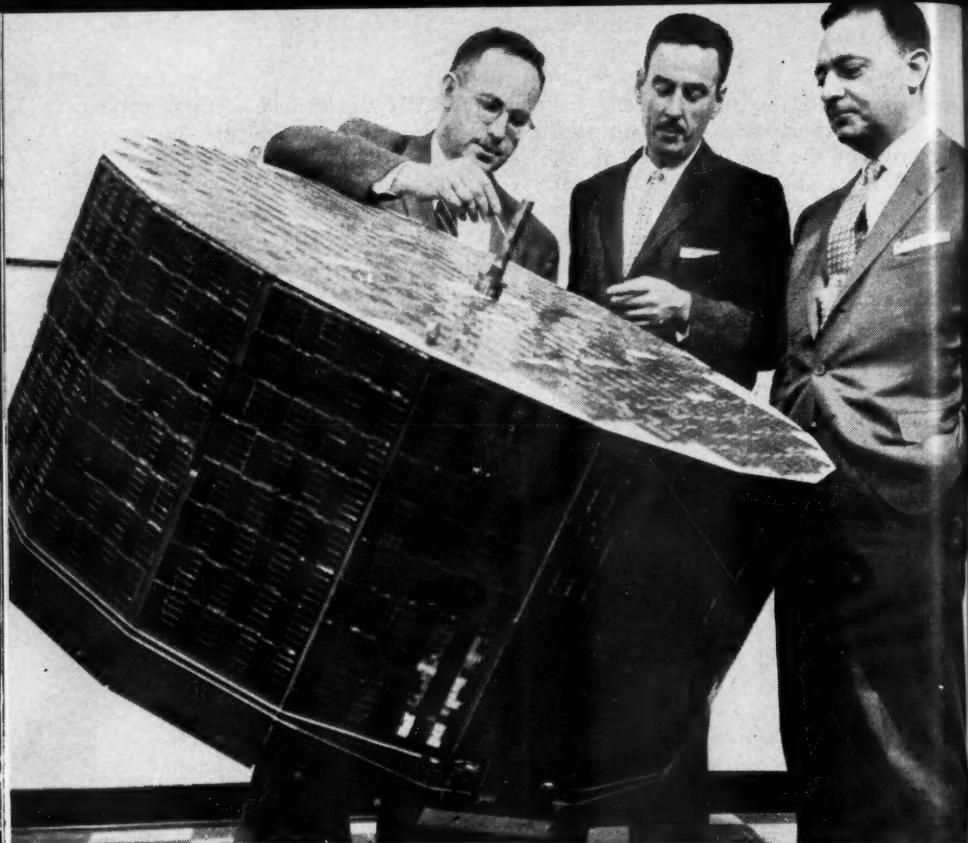
graphs. The significance of these performance figures to an Army requirement for greater capacity in global communications is evident.

AS AN experimental research and development vehicle, Courier used frequencies in the ultra-high range, never before used in a satellite for communications. The use of this band has several advantages. It is a relatively unused part of the radio spectrum and is generally free from interference by other man-made signals. It also is not disturbed by natural causes such as magnetic storms which can blanket the lower frequencies.

The 51-inch, 500-pound Courier included a payload of 300 pounds of electronic equipment. Design of the entire system was a cooperative effort of the military and of industry, representing teamwork at its best.

Master sergeant puts a whip antenna on Courier satellite, whose solar-cell-powered equipment sends 340,000 words on a single pass.





Technicians examine array of 9,200 solar cells covering the top and sides of Tiros weather satellite to provide power for sending pictures of cloud cover.

Despite its comparatively great weight, Courier was a triumph of miniaturization, using printed circuits, tiny modules and transistors. It contained only four conventional vacuum tubes—for the microwave circuits—and 1,300 transistors. Power was derived from a "skin" of 19,200 solar cells for charging miniature nickel cadmium batteries.

#### Development Progress

AS promising as Courier has appeared, it is only a beginning. Project Advent, being implemented by the U. S. Army Advent Management Agency set up by the Army Signal Corps at Fort Monmouth, involves development of a microwave communications repeater satellite in ac-

cordance with a "real-time" concept rather than the basic "delayed repeater" concept of Courier.

The proposed half-ton satellite will operate at a height of 19,300 nautical or 22,300 statute miles in a 24-hour equatorial synchronous orbit, thus appearing to hover in a fixed position with reference to earth. Three such satellites, equally spaced around the globe, would provide complete world coverage except for the extreme northern and southern polar regions.

During the research and development phase, and to prove the feasibility of the system, one satellite will be utilized to operate with a ground station on each coast—one at Camp Roberts, California, and another near Fort Dix, New Jersey. A shipboard

station, to be provided by the U. S. Navy, also is planned.

For many reasons, synchronous "real-time" satellites are the Army's eventual goal in space communications. How close that goal may be cannot be accurately predicted until the U. S. Army Advent Management Agency has completed Project Advent through the development, installation and total system evaluation phases, which may take several years. Many problems remain. However, solutions to these are considered to be within the reach of present technology.

In any event, communications satellites, both military and commercial, are now certainties of the Space Age. When available, they will provide our military services with a greatly enhanced communications system to meet the military requirements for capacity, speed, and reliability.

While these end-products of our research may seem fantastic and sometimes visionary, they are the result of a carefully planned, painstaking

ing, step-by-step process, wherein each new venture is evaluated on the basis of its practicality and its usefulness. Such is the stuff of which real scientific progress is made.

Projects Diana (January 1946), Vanguard I (March 1958), Score (December 1958), Vanguard II (February 1959), Tiros I (April 1960), Courier (October 1960) and Tiros II (November 1960)—

research and instrumentation for scientific investigation of the space environment—

development of technology for useful activities in space—

exploitation of earth satellites in furtherance of historic Army missions in communications and meteorology—

these all highlight the role of the Army Signal Corps in space.

We of the Army Signal Corps have made a beginning in this new dimension, as we did in electrical communications a century ago and in meteorology some ninety years ago. But it is only a beginning!

The Courier communications satellite received and sent back this "space-photo" of some of the Signal Corps scientists who helped make the instrument a success.

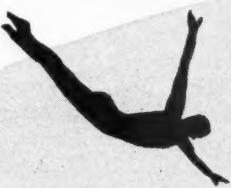


*The taxpayer benefits;  
the soldier's morale and welfare get a boost—  
and all because*

# Nonappropriated

**Lieutenant Colonel  
J. M. Metzgar**

THE SOLDIER reporting for duty at remote installations in Alaska, Okinawa, Germany, or training posts in the United States may be far from home geographically, but while off-duty on-post he soon discovers that many familiar "back home" recreational opportunities are close at hand. Bowling alleys, theaters, snack bars, golf, fishing and gun clubs, book stores, craft shops, service club entertainment are only a few of the facil-





# Nonfund Activities

## Pay the Way

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ties which ease the adjustment to Army life, Stateside or abroad.

These amenities have become so much a part of Army life and are so widely available that it is commonly assumed that they are derived entirely from Government funds, as part of the operating overhead of the Army. Actually, many of these morale-building activities are made possible by nonappropriated funds, which are generated by the soldier's patronage, at no expense to the Government.

There are few activities within the Army establishment from which individuals receive more tangible benefits and are generally less understood than the general subject of nonappropriated funds.

**LIEUTENANT COLONEL J. M. METZGAR,**  
*Adjutant General's Corps, is the Chief of the Nonappropriated Funds Branch, The Adjutant General's Office, Headquarters, Department of the Army.*

Just exactly what is a "nonappropriated fund?" The official definition states that "a nonappropriated fund . . . is an entity established by authority of the Secretary of the Army for the purpose of administering moneys not appropriated by the Congress for the benefit of military personnel or civilian employees of the Army and not incorporated under the laws of any State or the District of Columbia. Nonappropriated funds . . . are instrumentalities of the United States."

Expressed in non-technical language, this means that the Secretary of the Army has authorized Army organizations and installations to establish, and maintain, from their own resources, the financial operations necessary to provide themselves with essential commodities and services not provided through funds appropriated by the Congress.

Funds provided by Congress are



Service club workers bound for Korea get a briefing on Far East affairs from General I. D. White.

commonly referred to as "appropriated funds," whereas the type discussed here are nonappropriated funds. Because these nonappropriated funds, and the activities which they operate, do provide essential services for the Army, they are considered instrumentalities of the Federal Government and as such are entitled to all the immunities and privileges which are available under the Federal Constitution and statutes to the departments and agencies of the Federal Government. A specific example of the immunities which such statutes confer is immunity to State or local taxation.

In addition, nonappropriated fund activities are authorized the limited support necessary to accomplish their essential mission. For example, they may be provided with a building in which to conduct their activities and they may be supervised by military

and civil service personnel as a part of their official duties. The exact degree of support varies, depending on the type of fund or activity.

### Categories

NONAPPROPRIATED FUNDS within the Army are generally divided into three broad types—Revenue Producing, Welfare, and Sundry. The following examples are not intended to be all-inclusive but give some idea of each type:

**Revenue Producing Fund Activities.** The majority of major revenue-producing activities fall into one of the following categories: book stores, post exchanges, motion picture service theaters, Stars and Stripes, and post restaurants.

**Welfare Fund Activities** are divided into two broad categories—

**Military Welfare Funds.** Those most frequently encountered are:

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Department of the Army Central Welfare Fund, Major Command Welfare Funds, Central Post Funds, and Unit Funds.

**Civilian Welfare Funds.** Post Civilian Welfare Funds and the Army and Air Force Civilian Welfare Fund (the Central Fund) are the only authorized Civilian Welfare Funds.

**Sundry Fund Activities** encompass an almost infinite variety. Examples include: Department of the Army Central Mess Fund, Officers' Open Messes, Noncommissioned Officers' Open Messes, Golf Clubs, Rod and Gun Clubs, Chaplain Funds and Flying Clubs.

### Exceptions

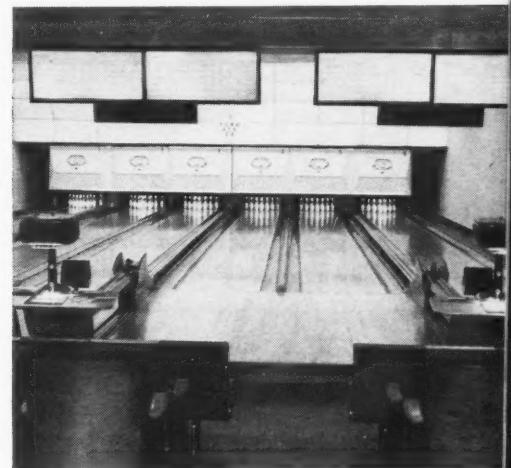
IT IS axiomatic that there is no rule without an exception. There are, of course, additional categories of funds not appropriated by Congress which do not fall into any of the three groups listed above. These can be generally divided into two broad categories. The first of these is:

**Special Funds Administered Under Separate Directives** such as funds of the Army Emergency Relief, Central Hospital Funds, Prisoner of War Funds, Patients' Trust Funds, Prisoners' Personal Deposit Funds, funds established for civilian employees at civil works activities of the Corps of Engineers, and funds established for contractors' employees at contractor-operated installations.

Special funds administered under separate directives are unique in that they are established to meet particular conditions and circumstances, and require specific implementing directives. They have been enumerated here in order to avoid any possible confusion with the three types of funds previously mentioned and, secondly, to prevent their being erroneously administered under Army Regulations 230-5. Each of these has its own separate directives which should be used as a guide if your duties require contact with any of them.



Officers' Open Messes, like this one at Fort Bragg, provide facilities for dining and other recreation.



Bowling alley at Carlisle Barracks and book store at Fort Eustis illustrate variety of activities that funds support.



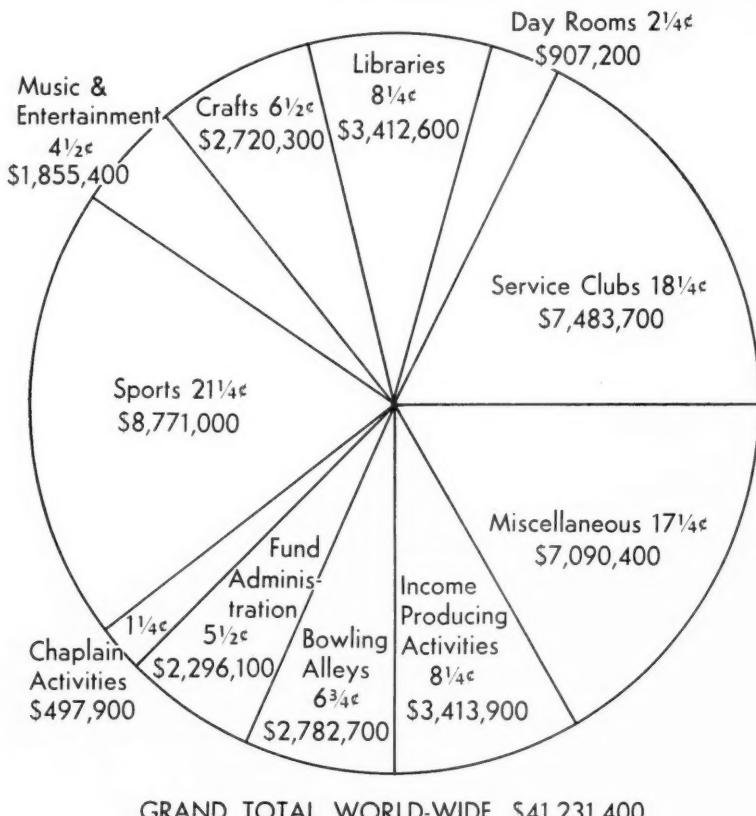
## **Nonappropriated Fund Activities**

**Private Associations** and funds thereof do not fall into the revenue producing, welfare or sundry fund categories; hence they are frequently confused with the official family of nonappropriated funds. It should be clearly understood that private associations, and funds thereof, are established by individuals and/or groups of individuals acting not within the scope of their official capacity as employees or agents of the government. They are *not* established to provide essential services, are *not* government instrumentalities, and are *not* entitled to the immunities accorded official nonappropriated fund activities.

Specific examples of organizations establishing private association funds and some of the activities which they operate are: thrift shops, Boy Scout funds, Girl Scout funds, officers' wives' clubs, noncommissioned officers' wives clubs, nursery funds (this may also be established as a Sundry Fund activity), Toastmasters Club, and the like.

Private associations exist on a military reservation only with the written consent of the Installation Commander. They may receive no financial support or assistance from either appropriated or nonappropriated fund sources except that they may be pro-

### **HOW THE NONAPPROPRIATED WELFARE FUND DOLLAR WILL BE SPENT WORLD-WIDE DURING FISCAL YEAR 1961**



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Bands and choral groups, such as one at Fort George G. Meade, are supported by Military Welfare Funds. They furnish music for varied occasions on many posts.

vided a place from which to operate if the space is not needed for essential activities.

Installation commanders may not appoint custodians for such funds nor are such funds supervised and administered as a function of command. They are not subject to the audit and accounting procedures prescribed for

official nonappropriated fund activities. The installation commander may inquire into their activities as often as he deems necessary and he may withdraw his consent for their existence on his installation.

If in doubt regarding the status of a specific fund, check the constitution and by-laws authorizing establishment

Nonappropriated funds provide many familiar "back home" recreational opportunities to servicemen and their families, ranging from swimming pools to sports activities.





An audience literally "rolls in the aisles" while enjoying a show staged by soldier talent like that of . . .

of that fund. If the authorization cited is sub-paragraph 2(b) of AR 230-5, it is definitely a private association and should be treated as such.

**Funds of Labor Unions, Federal Credit Unions, and Posts of Veterans Organizations.** Although installation commanders do not, of course, administer these funds, they do have certain responsibilities with respect to them if they are operating on a military reservation. As a convenient guide, specific delineation of the Commanders' responsibilities regarding labor unions and posts of veterans organizations can be found in Civilian Personnel Regulations E6. Guidance concerning the establishment and operation of Federal Credit Unions can be found in AR 210-24.

### Official Nonappropriated Funds

As a present or prospective manager of nonappropriated funds or simply as a participant in their operations, you will want to know the following basic facts regarding each type:

**Revenue Producing Funds.** Don't let the title confuse you. It is *not* the basic purpose of revenue producing funds to make money. Rather, their basic purpose is to provide essential commodities and services to authorized personnel, wherever they may be

stationed, at reasonable prices. As a by-product they may generate profits which are turned over to Welfare Funds to support recreational and welfare funds as follows:

<i>Revenue-Producing Activity</i>	<i>Welfare Fund(s)</i>
Army and Air Force Exchange & Motion	
Picture Services	Major Command, Central Post, and Unit Welfare Funds
Book Departments	Commandants' Welfare Funds
Post Restaurants	Post Civilian Welfare Funds

### Welfare Funds

**Military Welfare Funds.** Each year a forecast is made of commanders' requirements for military welfare funds, and this forecast is reconciled with an estimate of the Post Exchange and Motion Picture Services' ability to generate profits in the amounts required. The Headquarters, Department of the Army, then makes a firm commitment to major commanders to pay dividends at specified rates throughout the coming fiscal year. This enables commanders at each level to program intelligently, and to make commitments in support of special services and other military welfare activities.

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... this group of actors and musicians who write and produce own material to entertain military personnel.



Military Welfare Funds in the continental United States over the last few years have averaged over two dollars per man per month. Of this total, installation commanders (Central Post Funds) receive anywhere from fifty-five cents to one dollar per man per month, the amount varying according to the size of the installation. Unit or company commanders receive in their Unit Welfare Funds approximately fifty cents per man per month. The balance of the funds is administered by the Major Commander (Major Command Welfare Fund) for the purpose of equalizing benefits at installations within his command and to provide for contingencies such as recreational facilities and services at newly activated installations.

Installation commanders having military welfare projects which exceed their Central Post Fund capabilities may request a grant from the Major Command Welfare Fund. At each echelon of command—such as headquarters of an army, a post or a company—the Commander designates a custodian and council members to administer the fund. To serve on councils, the Commander appoints individuals on the basis of insuring that all troop elements are represented. In addition he includes members of his staff who are most concerned

with the soldiers' morale and welfare such as the Chaplain, the S-1, or G-1, and the Special Services Officer.

A Welfare Fund Council is obligated to perform the following services for the Commander:

- Ascertain that the fund is properly administered and safeguarded.
- Determine that all income is received and recorded.
- Budget for all requirements on an annual basis.
- Review all expenditures and insure that all disbursements are within the purpose for which the fund was established.

Welfare fund activities not infrequently find themselves in a position where there is insufficient income from normal dividends to carry out essential programs. In such instances, the installation commander is authorized to impose a nominal service charge in an amount sufficient to pay expenses only. An example of this type of activity is the bowling alley operation at most installations. The fees charged are paid into the Central Post Fund which acts as the fiscal agency for the bowling alley operation. These type activities are *not* classified as revenue producing funds because they do not have a secondary mission of producing profits. Service charges should be fixed accordingly.

## **Nonappropriated Fund Activities**

Another example of this type of fund activity is the revolving fund in the Special Services Craft Shops which makes available, as a matter of convenience, supplies needed by the Craft Shop patrons, on a reimbursable basis. A small mark-up, not to exceed 15 percent, is permitted to cover overhead expenses. Care should be exercised to insure that these types of Welfare Fund activities do not gradually become revenue-producing in nature, thereby defeating their purpose.

**Civilian Welfare Funds.** The basic principles of AR 230-5 govern the operation of Civilian Welfare Funds which derive their income from post restaurants and similar authorized activities. Civilian Welfare Funds provide recreational and other leisure time activities, and certain limited welfare services, which are considered by the installation commander to be essential to the individual and collective morale of civilian personnel of the installation.

To be fully effective, it is intended that facilities, services and activities financed through the civilian nonappropriated fund system will be planned and operated so as to serve objectives of the civilian personnel program and contribute to recruitment and retention of the civilian work force.

**Sundry Funds** are established to provide services *essential* to billeting, messing, or recreation of military

members of the Army and their dependents. The key word here is "essential." There is a certain latitude of discretion which may be exercised by the installation commander in determining whether or not a specific service is essential to the operation of his particular installation. For example, a given activity may be legitimately classified as essential by one Commander and established as an official nonappropriated fund activity. Another Commander may validly determine the same service or activity to be non-essential based on conditions prevailing at his installation, and only permit its establishment as a private association.

Sundry Funds are distinguishable from Welfare Funds in two principal respects. First of all they are composed of limited groups of individuals who are banded together by some common denominator. This may be the grade or rank of the members such as a noncommissioned officers' club, or a common interest such as golf, hunting and fishing, or flying.

Sundry Funds also differ from Welfare Funds in that they receive no financial assistance from revenue producing funds. They are basically self-sustaining and are operated with income derived from their respective members, who customarily pay dues as well as charges for merchandise received or services rendered. Profits are used for capital improvements to



At many posts, Central Post Funds support the football team. Here an Army team plays a Navy unit in Tokyo, Japan.

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U. S. Modern Pentathlon squad, picked from this group, represented nation in international competitive events.

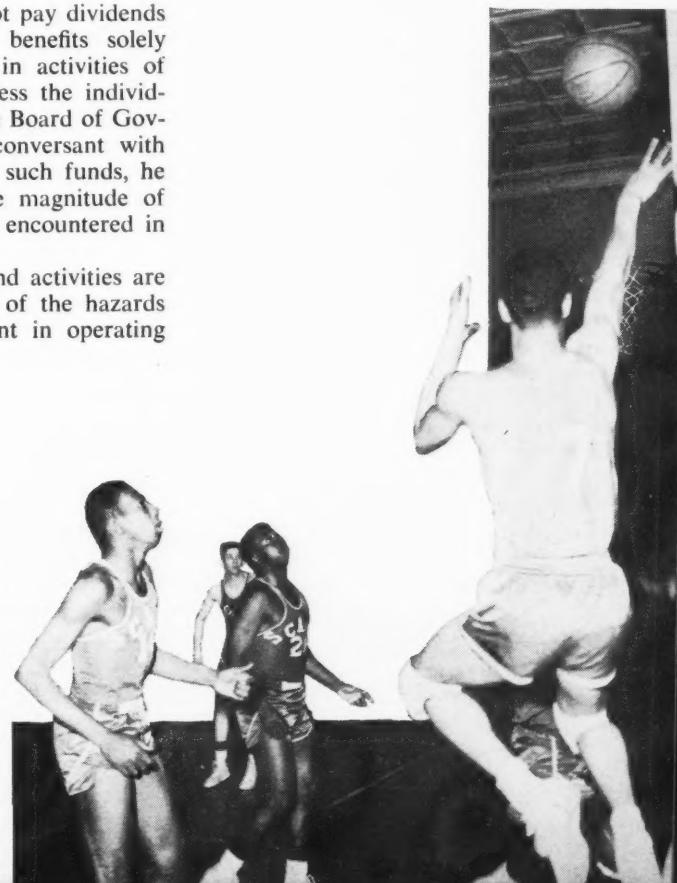


the physical plant, or for new furnishings and equipment.

Sundry Funds do not pay dividends and members derive benefits solely through participation in activities of the organization. Unless the individual is a member of the Board of Governors or otherwise conversant with the inner workings of such funds, he is apt to discount the magnitude of the financial problems encountered in their operation.

Because Sundry Fund activities are confronted with most of the hazards and difficulties inherent in operating

Basketball is a popular spectator event also, made possible at many installations by Central Post Funds.





Service clubs provide a wide range of entertainment, from small informal groups to a large formal dance.

any business enterprise, it is frequently difficult for them to render service of the caliber demanded by the membership and still stay "in the black." Sundry Funds pay the salaries of all their employees, they pay for all merchandise received, buy insurance, buy furnishings and equipment and usually provide the necessary funds to accomplish air conditioning and renovation of the building which the activity occupies. In many instances, open mess activities actually defray the construction cost of the building they occupy through loans from the Army Central Mess Fund.

One of the basic difficulties peculiar to this type of operation is its strictly limited potential, coupled with the fact that patronage ordinarily is limited to hours when military personnel are off duty. In addition, military posts are frequently, by their very nature, located appreciable distances from civilian community centers, thereby complicating the recruiting and retaining of a civilian staff.

Members of Army Sundry Fund activities should become conversant with the financial position of the fund and with the management difficulties encountered in such operations.

#### Common Misconceptions

ARMY Nonappropriated Fund activities provide an indispensable medium for troop and installation commanders to supplement the limited government funds appropriated for off-duty recreational purposes. It is a little known fact that nonappropriated funds generated by members of the Army establishment, both military and civilian, and their dependents, provide over seventy percent of the total funded requirements for morale and welfare services. Without them, Commanders would be seriously hampered in attempting to meet their responsibilities to provide an adequate morale service program.

Although Nonappropriated Funds do receive limited support in the form of command supervision, audit, and



Soldiers dance at service clubs. Here they swing partners to "Turkey in the Straw" in Germany and meet their dates for a formal event at a Stateside installation.

physical plants, they are conducted primarily at the expense of the man in uniform or his Army civilian employee counterpart. These facts are frequently not known even to the individuals who are generating the dollars which provide the program, or to the public at large. As a result the services which Army Exchanges, theaters, officers' and noncommissioned officers' open messes, golf clubs and other nonappropriated fund activities render are not fully appreciated either in or out of the Service.

In addition to serving basic needs

of the military community, nonappropriated fund activities save the taxpayers literally millions of dollars annually as a result of the revenue which they generate. Each member of the military service has a definite obligation to inform himself regarding these "fringe benefits," in order that he may adequately explain that the Army is basically self-sufficient in providing the many off-duty recreational activities so essential in promoting and enhancing the morale, welfare, and recreation programs which make for a finer soldier and a better Army.

Soldiers who prefer other types of entertainment readily find partners of like mind for chess and other games.



**In the "Land of the Morning Calm"  
goodwill activities break new ground  
as U.S. troops join in**

# **Waging Peace Through Understanding**

**Sp4 Alan R. Black**

**S**HINHYUN RI is a small town of about 400 people, situated some 50 miles southwest of Seoul in Kyungii Province. It is rugged, forbidding country, accessible only by a single unpaved road, rut-frozen in the winter, alternately mud-filled and dust-choked during the other seasons.

Captain Sang Han Kim and Major Brady Vrandenburg of the Seoul Area Command Armed Forces Assistance to Korea (AFAK) office were making an inspection of the Shinhyun Ri primary school, to determine eligibility

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**SPECIALIST FOURTH CLASS ALAN R. BLACK** is an Information Specialist in Information Section, Headquarters, Eighth U. S. Army, Korea. Off-duty, he conducts one of the language home study groups described in the article.

for AFAK aid. In one of the classrooms, the two officers found little seven year-old Jin Koo Chang crouched over her lessons on the floor. She was trying to write but couldn't because of an enormously swollen right hand. When asked if she was being treated for the infection, school officials replied that the isolated village had no medical facilities.

Upon returning to Seoul, the two officers notified the Seventh Logistical Command Medical Section. With approval of the Command Surgeon, they obtained the services of the Korean Medical Liaison Officer to administer needed medicine and dressings.

Jin Koo's hand is now well and she does her writing at an AFAK-supplied school desk.



But the story doesn't end there. Just before Christmas, the Mayor of Shinhyun Ri along with Jin Koo's teacher and the president of the local PTA boarded a bus and made the five hour trip into Seoul. They went to the AFAK office where they presented Major Vrandenburg with a cake. On it was inscribed "*Komapsumnida*"— "thank you" in Korean.

The townspeople's immediate and grateful response to Major Vrandenburg's kindness is typical of the Korean folk. They are, as many of our servicemen have discovered, a warm, sensitive, and responsive people. "Give them a chance to get to know you,"

as Sergeant A. D. Walker, First Sergeant of Headquarters Company, Special Troops, Eighth U. S. Army said, "and they are the best friends in the world." The sergeant reflected a moment. "And once you get to know them, it's hard not to like them too."

While the sergeant spoke, he and thirty other men from Headquarters Company were installing a 375-gallon water tank outside the Han Kuk Orphanage. It was a Sunday afternoon and the children were ringed around the men, some watching quietly with big eyes, others, in a half holiday mood, frolicking and laughing.

The water tank project had begun



When officials visiting school found little Jin Koo with swollen hand, they sent medical aid to her.

the previous weekend when men from the company had brought some clothes to their "adopted" orphanage. While there they noticed some of the older children carrying water uphill in buckets from a well fifty yards away. Inquiry revealed that in addition to the back-breaking work involved, water for cooking, washing clothes, and bathing was rationed.

The men put their heads together and decided to do something about this. During their off-duty time, they cut and welded old oil drums. Someone found and repaired an old pump. Pipe appeared from somewhere. By the end of the following weekend, water rationing at the Han Kuk orphanage was a thing of the past.

#### **Understanding in Action**

"GIVE them a chance to get to know you . . .," the sergeant had said. This is the heart of the People-to-People program in Korea—recognition of the importance of the impression made by the individual who works within the framework of a larger

organization. People-to-People is a program of communication between Americans and Koreans. It is designed to establish two-way relationships from which international friendship and understanding can grow. It is based upon a belief in American values and way of life—and a recognition that the individual, by his example, is its best salesman.

In addition to cooperating with such civilian agencies as the United States Operation Mission in Korea (USOM-K) and the United States Information Service (USIS), the Eighth U. S. Army assists in fostering the people-to-people idea through its own information and service media. The program is constantly encouraged by the Armed Forces Korea Network (AFKN) radio and television stations, by unit newspapers, and by unit commanders in their troop information hours.

The AFAK program is a unique Eighth U. S. Army project which has done much to make the Korean people aware of the continuing interest and cooperation of the American people. The program was begun in 1953 when General Maxwell B. Taylor, then Commanding General, Eighth Army, proposed that approximately 15 million dollars worth of U. S. construction materials, then not required for the original combat projects, be utilized in the reconstruction of Korean public facilities destroyed during the war.

Thus began a building program in which the American and Korean people take justifiable pride. Lumber originally intended for field hospitals was used to frame school buildings. Cement intended for bunkers was used as foundations for orphanages and schools and hospitals. American soldiers volunteered to perform construction work during their off-duty hours. Trucks and drivers were provided by the Transportation Corps when they could be spared from regular military duty.

In succeeding years, additional appropriations by the U. S. Congress have enabled the Eighth Army to continue the program. Primarily, these funds provide U. S.-furnished supplies and equipment which are not readily available to the Korean populace. These materials are used in the construction of projects recommended by Korean civic leaders as the type most needed and most beneficial to the maximum number of people. In general, projects have been confined to health facilities, schools, orphanages, and civic buildings.

### Improving Communication

THE care and concern for Jin Koo's hand and the spontaneous enthusiasm which led to the installing of a water tank for the orphanage are acts which transcend the language barrier; they speak for themselves. Yet better understanding depends largely upon better communication. This is one of the greatest problems facing the People-to-People program in Korea.

Colonel William O. Gall has done much to remedy this situation in the community of Chunchon where his 4th U. S. Army Missile Command is located. All officers and NCOs of the Command are required to take courses in Korean language. In addition, many enlisted men attend the courses voluntarily. None expect to become fluent in the language during their relatively short tour in Korea, but, almost without exception, the men have found that even a few simple phrases are well received.

To supplement this program, a system has been initiated to "teach the teachers" better English so that the Korean children under their tutelage can learn to speak the language more effectively.

Aiding in this endeavor, the 4th U. S. Army Missile Command conducts a "cultural exchange program" in a broadcast heard five times each week over the local Armed Forces

radio station. Devoted to teaching the English language, the program offers instruction both in English and Korean by the Information Officer and a local high school teacher. Scripts are made available for study in all Korean schools in the area.

To further facilitate language study and cultural exchange, a weekly radio program carried over a local Korean station features representative American music—folk, semi-classical, jazz. As with the language program, pamphlets translating the text are available and in steadily rising demand.

Underlying all of these projects is the conviction not only that "we have something worthwhile to sell," but that the results of the programs are tangible and important. "The people here, I feel, are proud of our Command," Colonel Gall has said. "The people know us and know that we are on their side. In the event that we must defend Korea, we have already established solidarity."

### Home Study Groups

MANY servicemen, in their off-duty time, teach English to small groups of Koreans, ranging from three to ten people. The students come from all walks of life—college students, businessmen, bankers, office employees, teachers. The classes have sprung up spontaneously without any official organization so that it is impossible to tell with any degree of certainty how many of them there are. A conservative estimate is that there are one thousand such groups in the Seoul area alone.

Classes are held wherever space is available—sometimes in vacant school-rooms, sometimes in the back of a shop, but most often in the home of one of the students.

Almost every soldier who is teaching will tell you that he has learned at least as much as his students have. He not only learns some of the language, but, because of the setting of the classroom, he also learns much



7th Infantry Division officers take part in Activity Day for Korean Scout Troop. At right, this primary school near Ascom was constructed through AFAK program.

about the home life and customs of the Koreans.

PFC Peter Egnatovich who works at the Eighth Army Adjutant Section conducts a class typical of many others. There are four students, all recent graduates of Yon Sei University —Mr. Chun, who works in his father's contracting business; Mr. Hwang, a civil service employee at the Korean Foreign Ministry; Miss Yi, manager of a small dress shop; and Mr. Im, a clerk in a bank.

The class meets three times a week, on Monday, Wednesday, and Friday evenings, at Mr. Hwang's home. Pfc Egnatovich arrives at seven o'clock and, because it is a Korean home, takes off his shoes before entering. Once inside, after an exchange of greetings, the group sits cross-legged on the floor; the textbooks are brought out (Egnatovich purchased them himself) and the lessons proceed along traditional lines.

First, there is reading aloud with the students reading in turn after Egnatovich has recited the passage. Pronunciation is emphasized. Words and grammar are explained. "What's the difference between an avenue and a street?" "When do you use *an* and when do you use *the*?"

After one hour of this, Egnatovich will assign a brief composition or dictate a short passage. Mr. Hwang's mother then brings in coffee and the four young people spend the next hour

or so talking. Often they will look at American magazines and newspapers which Egnatovich provides. Questions and conversation flow in a curious and animated mixture of Korean and English, with topics ranging from women's fashions to school systems to eating habits. When a question comes up that Egnatovich can't answer, he writes it down and tries to get the answer at the post library or at the Army Education Center.

The genuine enthusiasm of these classes has grown into a mutually warm and personal regard. "We were sitting around talking after class one night," said Egnatovich, "and Mr. Hwang was pouring me a cup of coffee. Suddenly he looked at me and grinned. I saw that they were all smiling and I asked what it was all about. Miss Yi explained that it was the custom in Korea to use two hands, one on the handle and one on the lid, when pouring for strangers or honored guests. Mr. Hwang was pouring, for the first time, with only one hand—the custom among close friends."

Scenes such as these are not the exception, but are now the rule. Multiplied many times over, they illustrate the scope and diversity of the People-to-People program in Korea.

EMPHASIS of the People-to-People program is personal rather than official. Yet the programs are comple-

mentary. Perhaps the best examples of the blending of these personal and official levels of contact are to be found in the Community Relations Advisory Councils (CRAC).

Purpose of these councils is to improve relationships between the U. S. military forces and the local Korean communities by exchanging information of mutual interest, advising appropriate local officials, community leaders and U. S. commanders on matters affecting the U. S. forces and the community. They study local problems and stimulate wholesome contacts by means of jointly sponsored entertainment, athletic contests, youth activities, and similar programs that engender understanding and common effort. There are currently 25 active Community Relations Advisory Councils throughout Korea. Eight of them are located within 20 miles of the 1st Cavalry and 7th Infantry Division areas.

Council meetings are held each month and serve as a forum where members can seek assistance and advice on local community problems. Special meetings are held on short notice when pressing problems or misunderstandings arise. The council meetings thus provide a continuing channel of communication between American officials and their Korean counterparts. The fact that all meetings are conducted in Korean and English through interpreters and that they are open to the press has done much to improve understanding and

further increase mutual respect.

The councils also support a varied program of educational and cultural activities. Films obtained from the United States Information Service are shown in Korean communities for education and entertainment. Several councils sponsored the showing of open-air movies in the villages during the summer months. It is estimated that as many as 200,000 Koreans—many of whom had never before seen a movie—viewed the programs.

OTHER educational activities in the community relations field include the distribution of USIS pamphlets, exhibits, and close coordination with instruction in English conducted by U. S. military personnel.

In addition, an intensive program to promote youth activities among Koreans is being well received. Units of the Boy Scouts of Korea and Little League baseball teams are sponsored by several military installations. In many instances, help has been provided in the form of uniforms and equipment.

One of the objectives of the Armed Services Committee of the Korean People-to-People Program, as spelled out in its charter, is "to wage peace with the vigor, resourcefulness, and universal participation of wartime."

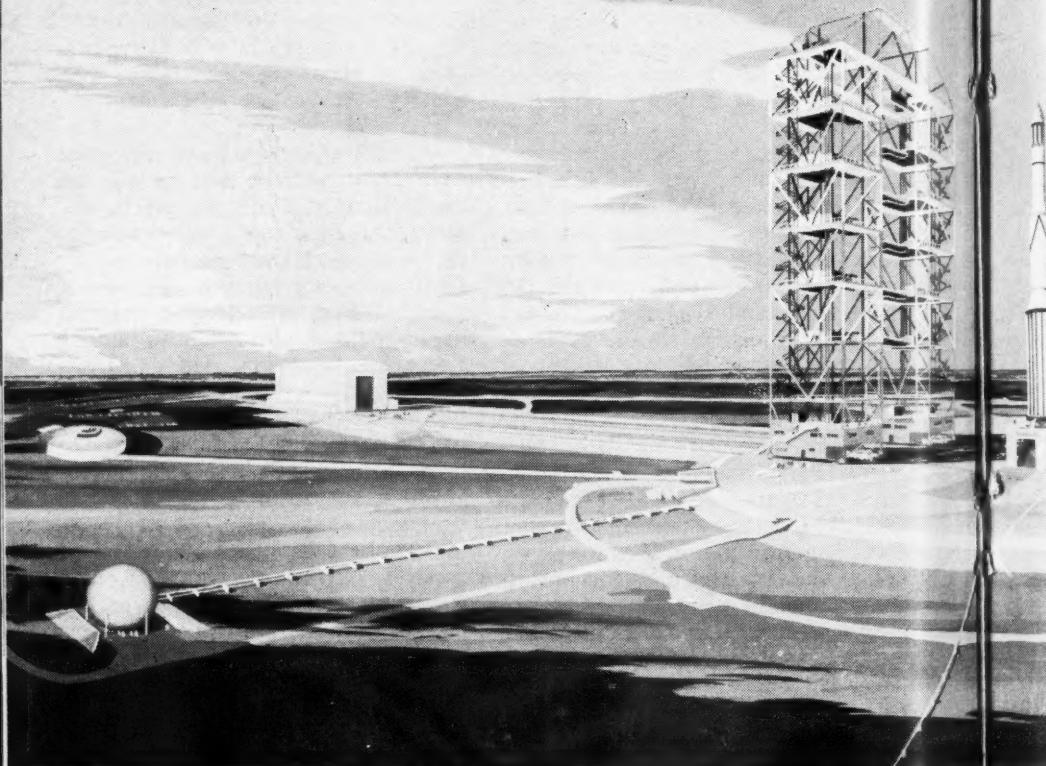
The officers and men of the Eighth United States Army are keenly aware of this continuing challenge, as they carry on a People-to-People program as an integral part of their mission.

Pfc Peter Egnotovich, using books he bought with own funds, holds English class in home of one of his students.



*At Cape Canaveral, the Corps of Engineers builds a*

# Space-Port fo



**O**N WHAT was a rattlesnake-infested strip of palmetto land at Cape Canaveral only a year and a half ago, there is today nearing completion by the Army Corps of Engineers, America's first launch facility designed primarily to serve as a take-off point for boosting heavy research rockets into outer space.

This eleven-million dollar launch complex is designed for the Saturn rocket, which is under development by the National Aeronautics and Space Administration at the George C. Marshall Space Flight Center. CAPTAIN FREDERICK F. IRVING, Corps of Engineers, is Project Officer for construction of the Saturn tower, Patrick Air Force Base, Florida.

# for the *Sixties*



**Captain Frederick F. Irving**

C. Marshall Space Flight Center and the U. S. Army Ballistic Missile Agency, Redstone Arsenal, Alabama.

Until now the lack of a giant rocket capable of putting heavy payloads into space has been a drawback in America's space program. The Saturn has been designed to meet this critical need.

With its eight rockets packing 1.5 million pounds of thrust in the main stage, and upper stages ultimately generating an additional 905,000 pounds of lift, the Saturn will be capable of carrying 45,000-pound payloads into earth orbit for the first time. With such lifting power, the United States will be capable of

## **Space-Port for the Sixties**

putting several men in orbit, launching planetary probes or making soft landings on the moon with instrument packages. With initial launchings scheduled for 1961, the Saturn is expected to continue throughout the Sixties as America's prime heavy space vehicle.

Construction of the vital launch complex for this rocket is currently being done under the U. S. Army Engineer District, Jacksonville, Florida. The blockhouse containing the launch facilities has already been completed. It consists of a domed concrete inner structure sixty-nine feet in diameter on which 11,000 cubic yards of earth fill has been placed to a depth of seven feet.

The twenty-six foot ceiling height within the air-conditioned blockhouse provides two floors to hold the instrumentation and operating personnel during launch operations. A two-foot thick steel blast door protects the entrance. Underground tunnels serve as emergency exits and are also used to draw fresh air into the air conditioning system.

To construct the concrete dome for the Saturn blockhouse, Diversified Builders, Inc. built a special set of four arched steel segmental forms with a central support column. The blockhouse dome was divided into twelve segments, and two segments of concrete were placed at a time while forms for the next two were being prepared. This method proved economical by eliminating the extensive interior bracing necessary if temporary forms had been used. The segmental forms can be reused in construction of similar design.

### **Launch Pedestal**

BECAUSE the Saturn engines produce the largest amount of rocket thrust ever controlled by man, considerable study was given to the foundation requirements for the launch site. The decision was made to use the patented "vibroflotation" process

to compact the sandy subsoil beneath the launch pad proper and the service tower. By this process, the sub-soil could be compacted to a maximum depth of 28 feet, and thus withstand the tremendous launch vibrations expected, more cheaply than piling could accomplish the same objective.

A total of 1,881 penetrations were made with the vibroflotation mechanism using 6,965 cubic yards of backfill material. This produced a relative density of 80 percent in the foundation area.

The Saturn blockhouse is connected to the launch pedestal by a covered cable-way which protects the instrumentation and launching control cables. The launch pedestal is designed to support the 500-ton rocket during servicing and launching operations. These facilities, plus the high-pressure helium and nitrogen storage and fueling facilities, were constructed by the H. C. Beck Company.

In order to withstand the tremendous thrust just prior to lift-off, the pedestal foundation, measuring some 106x160 feet, incorporates 4,400 cubic yards of concrete and 580 tons of reinforcing steel.

Atop these foundations, the pedestal proper has four 27-foot reinforced concrete columns which support the bearing ring and anchor bolts for the eight rocket support arms. As an indication of the close tolerances required in the construction, each of the 400 anchor bolts projecting from the reinforced concrete pedestal must be within a 1/16-inch tolerance.

The concrete columns are protected from blast effects of the rocket by insulated steel liner plates. A steel flame deflector rolls underneath the rocket on railroad tracks to deflect the blast to either side where fire brick protects the 10-inch thick concrete paving which surrounds the pedestal.

Additional protection from the searing heat of the rocket motors is provided by a deluge water system. This system, fed by a 36-inch high-pressure



Movable segmented steel forms fabricated for construction of the blockhouse frame the workmen installing conduits that will carry instrumentation and control cables.

water main, saturates the pedestal with protective sheets of water.

#### Service Tower

BY FAR the most striking feature of the Saturn launch complex is the 310-foot high, four-million-dollar mobile steel service tower. This tower,

containing a bridge crane with two hooks of 60- and 40-ton capacity, provides a means of erecting the rocket on the launch pedestal in stages. Working platforms give access to the many electrical and mechanical systems during checkout adjustment.

After serving these functions at the

## **Space-Port for the Sixties**

launch pedestal, the service tower must be moved 635 feet to an off-site area where it must be adequately anchored down during the firing. For this move, the service tower runs on two parallel sets of railroad tracks adjusted to 1/32-inch tolerance in elevation to minimize sway in the 28-story structure.

During movement the tower is supported on four twelve-wheel carriages. Each carriage consists of three rigid four-wheel truck assemblies with 36-inch diameter flanged steel wheels.

The 2,800-ton tower requires absolute equalization of load between the trucks on each carriage—and this is accomplished by a hydraulically operated equalizer beam between the carriages and the tower support points. These same hydraulic cylinders are used to jack the tower off the tie-down anchorages and onto the rail carriages before movement.

Tie-down anchorages are necessary because Cape Canaveral is in the hurricane zone; consequently, design criteria specify that the tower must withstand winds of 125 mph. The tremendous overturning moment of such winds on the 310-foot tower places excessive loads on the wheeled undercarriage.

The problem was solved by designing tower tie-down bases at the four corners of each leg of the tower. The bases sit astride steel anchor rails on heavily reinforced concrete foundations. Positive lock-down of the tower is effected by hydraulically driven wedges which pass through slots in the tower bases and the anchor rails.

The tower contains its own 400 KW diesel-electric generator which powers four 100 HP motors, one on each carriage, to move the giant structure. Automatic controls prevent it from skewing on the two sets of

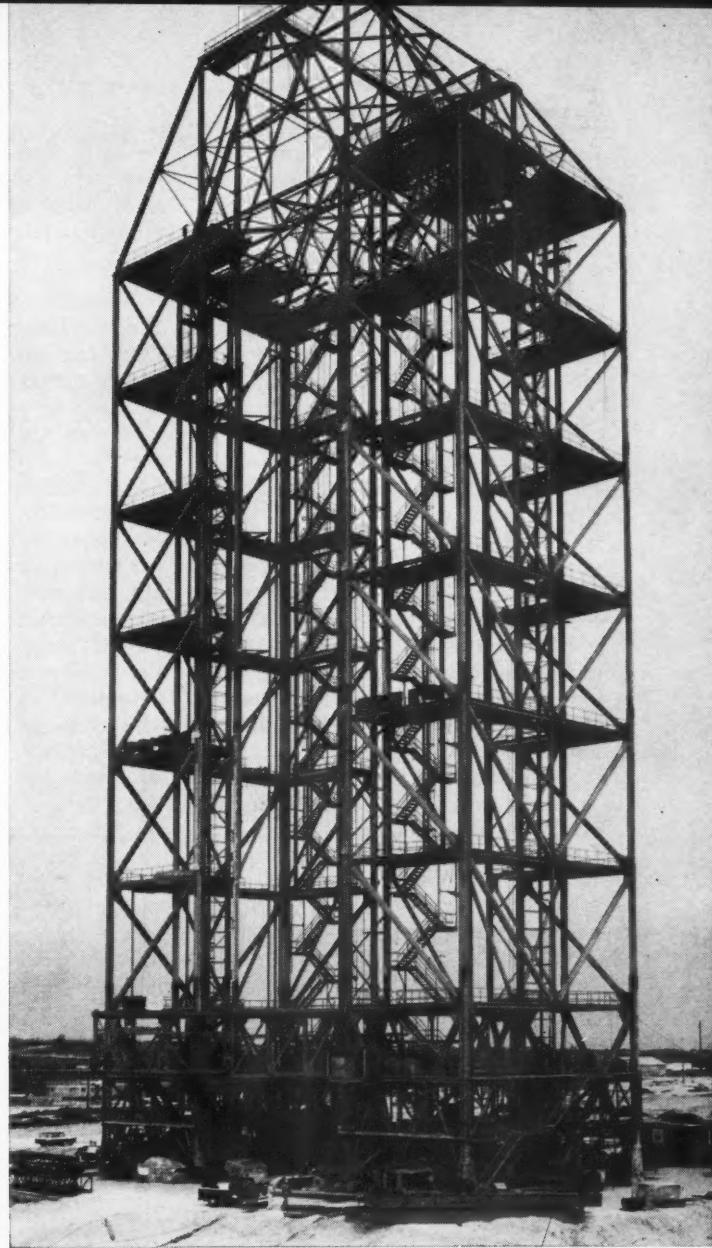
**Heavily reinforced spread foundations were placed before the launch pedestal was constructed in center of blast-resistant concrete and fire brick pavement.**



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The 310-foot high Saturn service tower will weigh 2,800 tons and move on two sets of railroad tracks. Aluminum service platform will provide air-conditioned working space on five levels.



tracks, while the operator's controls permit varying speed from  $1\frac{1}{2}$  to 40 feet per minute. Pedestals at the launch site and at the off-site position provide electrical power and communication connections when the tower is stationary.

The base of each tower leg contains a two story air-conditioned building to house check-out instrumentation and tower controls. Service platforms, located at five different levels on the tower, can be positioned mechanically to fit closely around the rocket.

## **Space-Port for the Sixties**

Each air-conditioned platform is enclosed by adjustable aluminum panels and can be reached by any one of three elevators, or by stairways.

### **Escape Mechanism**

AFTER the tower is completed, a unique escape device will be added to enable personnel to evacuate the tower quickly if necessary during the hazardous fueling and servicing operations. Essentially, it will consist of steel capsules lined with foam rubber, each capable of holding one man. The capsules will ride on rails bolted vertically to the tower and will be positioned one above the other, much like cigarette packs in a vending machine. They will be so located that, in the event of emergency, a man can jump into the capsule, close the door, pull a lever, and speedily descend along the rails which curve off the tower behind a revetment where the capsule is braked to a stop by water.

As the first capsule is released, another will automatically drop into

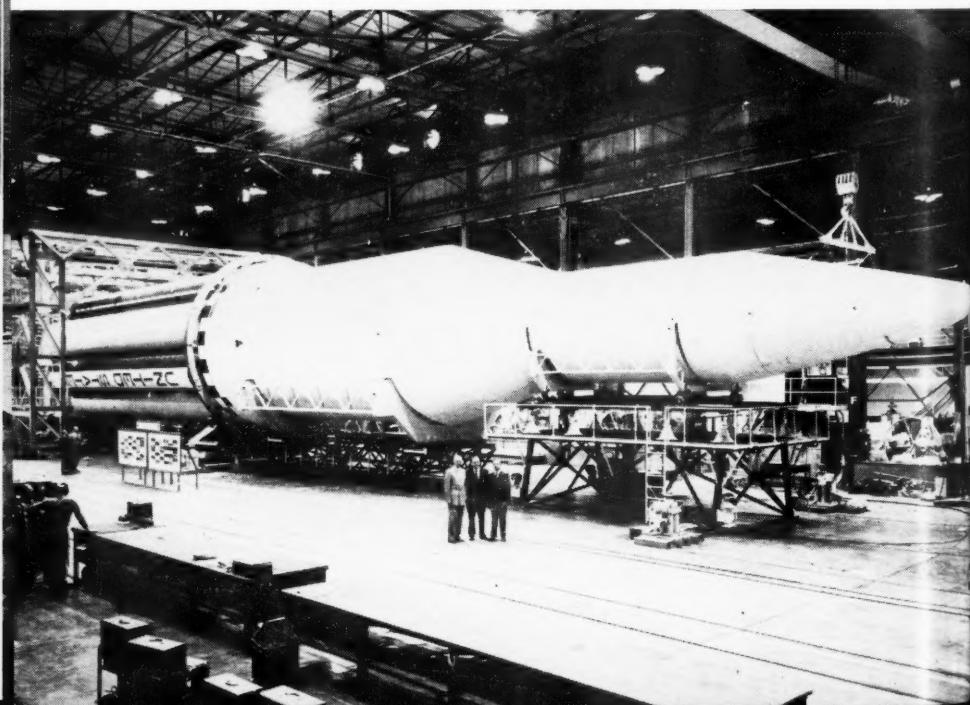
position at the service platform and the cycle will be repeated as necessary. Maximum capsule speed will be approximately 45 miles per hour.

### **Team Effort**

DESIGN and construction of the Saturn launch complex at Cape Canaveral required the closest possible cooperation and coordination between NASA, the designers, contractors, Army Corps of Engineers, and the Air Force. The fact that such a unique and complex construction project was completed ahead of schedule is a tribute to all concerned.

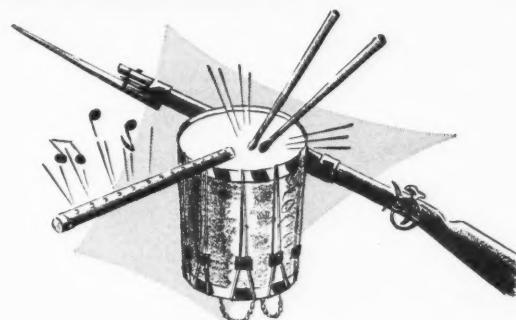
Construction of the Saturn launch complex was supervised by the U. S. Army Corps of Engineers, Jacksonville District. Prime contractor for the service tower was Kaiser Steel Company, with steel fabricated by the Nashville Bridge Company. Design of the complex was by Maurice Connell and Associates, Miami, Florida. Final design of the service tower was by Kaiser Steel Company.

Some conception of size of Saturn rocket may be gained from this view at the George C. Marshall Space Flight Center where it was assembled for tests.



*With fife, drum and bayonet,  
the Army revives a traditional ceremonial—*

# Prelude to Taps



**A**N OLD American military tradition has been revived by the Army's oldest active infantry unit, the 1st Battle Group, 3d Infantry, known as "The Army's Old Guard." Presented three times early this year, plans are to repeat the "Prelude to Taps" program, a two-hour show modeled after the even older British "Tattoo," during ensuing months at Fort Myer, Virginia.

An intermingling of the old and the new, the presentation features the Old Guard Fife and Drum Corps in colonial costumes, the U. S. Army Band and Chorus, and a demonstration of modern-day Ranger tactics.

Starting with an opening fanfare by the Army Band's Herald Trumpets, a pageant of the 50 state flags culminates in the raising of the Stars and Stripes over the massed banners. Then 185 years of Army history pass in review as soldiers dressed in period uniforms appear before huge maps of the world, hung with the Army's 145 battle streamers.

A "Colonial Camp Duty Show" demonstrates what it was like to serve in the Army during the Revolutionary War, with members of the Fife and Drum Corps taking a colonial soldier through his duty day—a routine which in many respects has not changed much since that time. At the end, the Corps forms a battle line

and fires old British Tower muskets loaded with black powder.

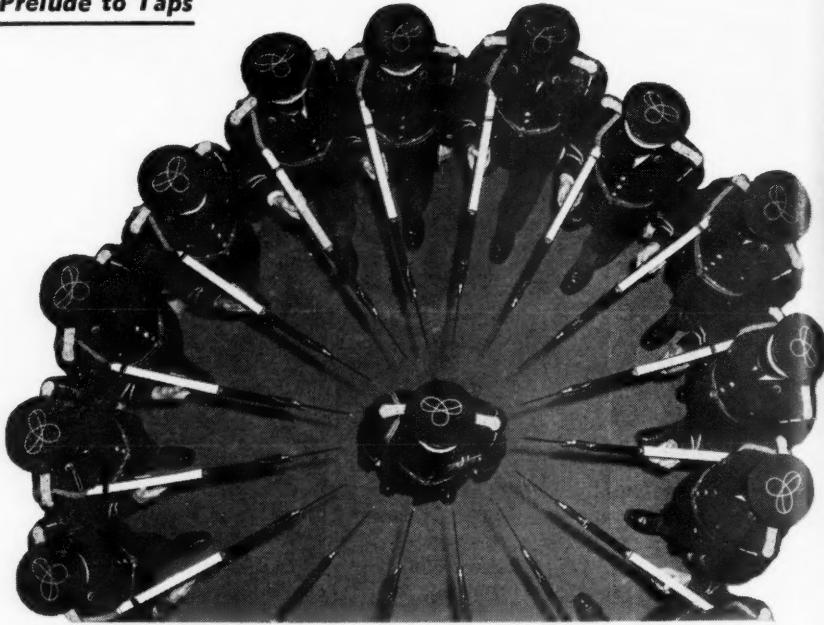
When the smoke clears, the Honor Guard Drill Team marches into the hall. In their dress-blue uniforms, the men execute a series of intricate maneuvers, made more difficult by fixed bayonets. The 3d Infantry, incidentally, is the only regiment which now marches with unsheathed bayonets, as a concession to past valor.

Following an intermission, the Army Band plays, then men of Company A carry out the intricate maneuvers of the almost forgotten "Musket Minuet." This consists of ten separate exercises. In another colorful feature, the "black manual" is presented; this is done silently in total darkness with a fluorescent semaphore signal giving the commands.

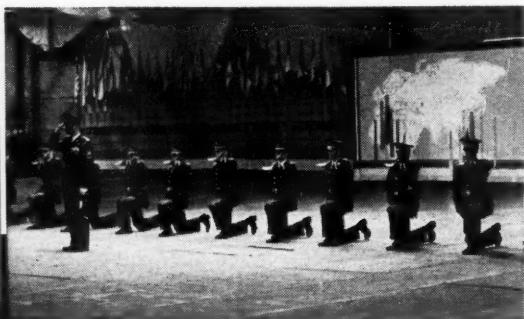
Modern Infantry techniques are demonstrated by Old Guard soldiers who have received Ranger training. Swinging down from the rafters on ropes, they proceed to demonstrate how to handle an enemy with knife or gun. After the units pass in review, the Army Band ends the pageantry with a presentation of "Silver Taps."

The program was performed this winter under direction of Major Donald K. Polifka, with narration by Sp4 James C. Moore and PFC William F. Hennessey.

## Prelude to Taps

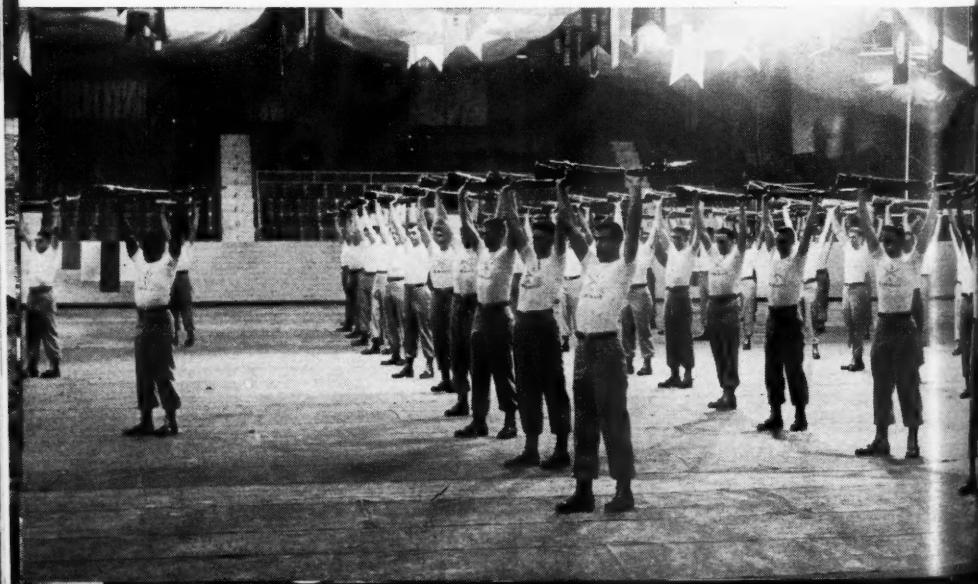


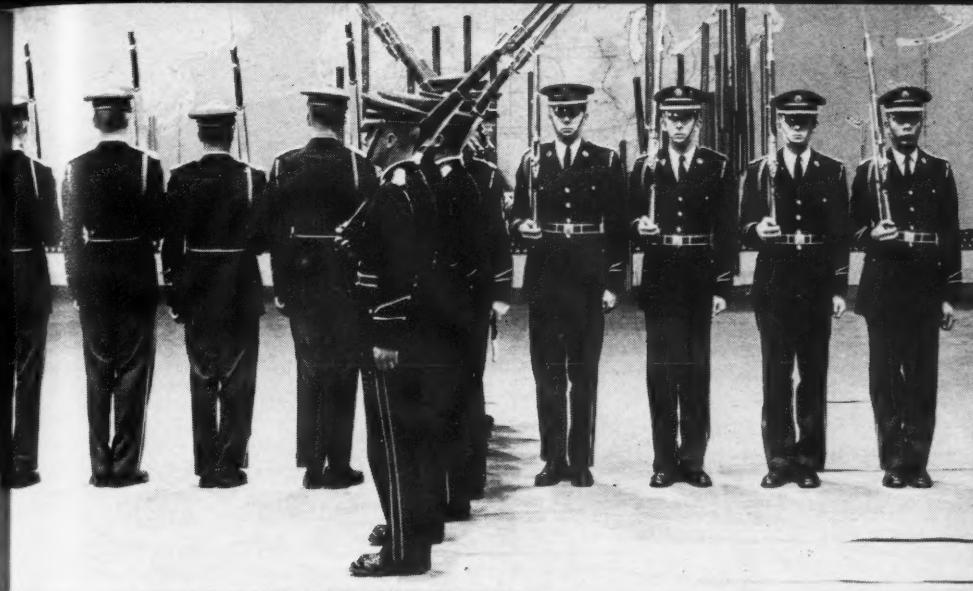
In dress-blues, the Honor Guard Drill Team marches with fixed bayonets.



Team climaxes presentation by a rifle salute.

Intricate maneuvers of almost forgotten "Musket Minuet," done in ten separate exercises, are performed by expert team.





As special concession to past valor, the 3d Infantry is only regiment in the Army that marches with unsheathed bayonets.

Drill  
nets.

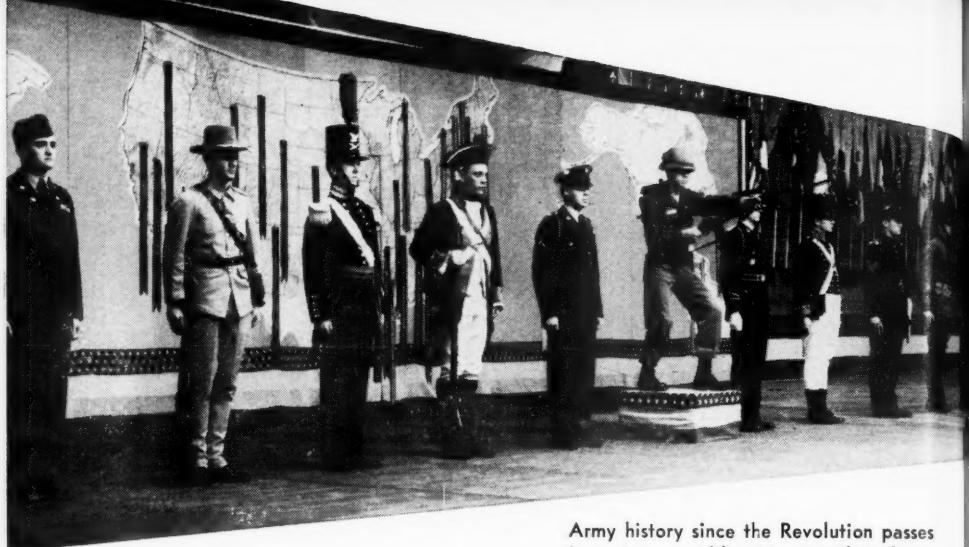
often  
rate  
team.

Action includes display of self-defense tactics.



Old Guard soldiers who have received Ranger training show Infantry techniques.

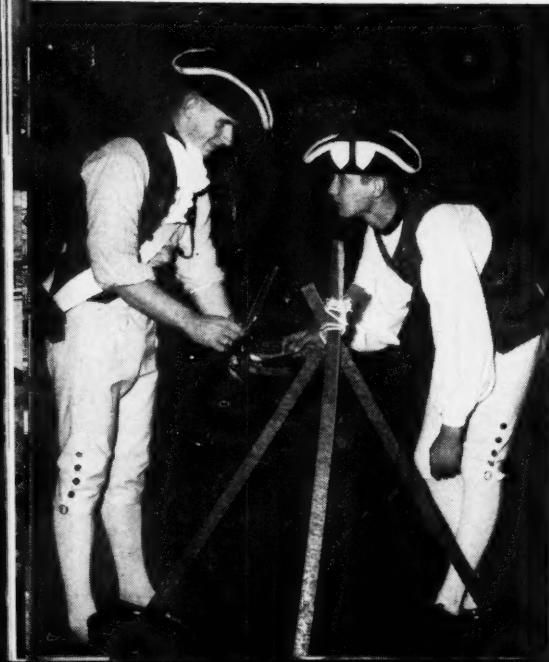


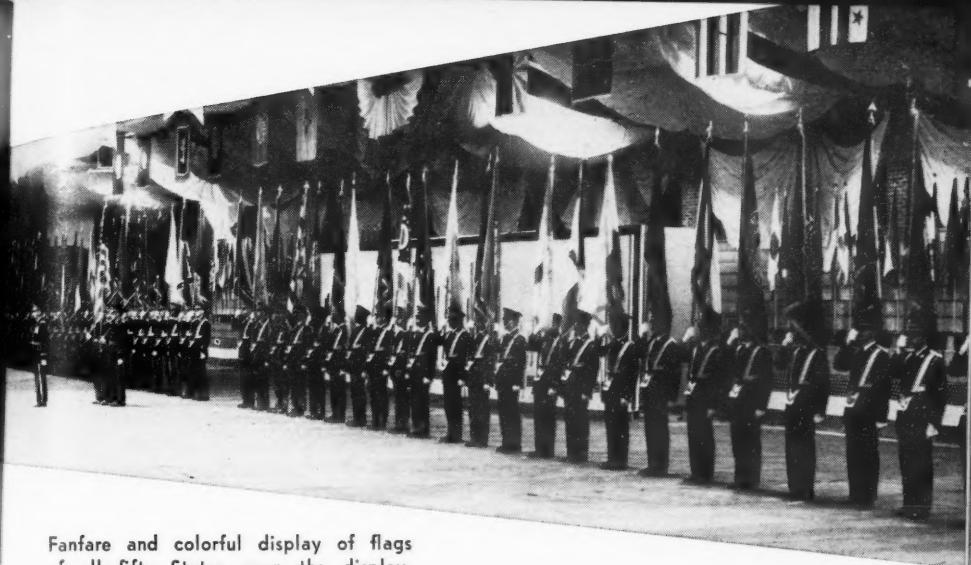


Army history since the Revolution passes in review as soldiers in period uniforms appear before huge map of the world.



Fife and Drum Corps above takes Colonial soldier through typical Revolutionary War duty day, at left.





Fanfare and colorful display of flags  
of all fifty States open the display,  
followed by raising of National Emblem.



Stirring martial music is  
provided by Fife and  
Drum Corps.



Climaxing their appear-  
ance, the Fife and Drum  
Corps forms battle line  
to fire muskets loaded  
with black powder.

**Your enlistment and continuance in service  
will be governed by  
the newly simplified and realistic**



# **Army Medical Fitness Standards**

**Major Paul E. Cevey**

**T**HE recent publication of Army Regulations 40-501, Standards of Medical Fitness, marked the completion of two and a half years of combined efforts of the professional and administrative staffs of the Army Medical Service to codify and modernize the Army's medical fitness standards. The project was under the Chief, Physical Standards Division, Office of the Surgeon General.

Primary responsibility for administering the standards has been dele-

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**MAJOR PAUL E. CEVEY, Medical Service Corps, was until recently on duty in the Office of the Surgeon General, Department of the Army.**

gated to the Army as executive agent of the network of 70 Armed Forces Examining Stations.

Rapid advances in the technology of war and the fluid, ever-changing international situation require that medical fitness standards be up-to-date in every respect. Before the project was initiated, medical fitness standards applicable to the Army were contained in AR 40-105, AR 40-110, AR 40-500, AR 40-503, AR 40-504, TAG and TSG letters and as a part of a multitude of other Army regulations, circulars and other instructions.

This myriad of directives, some of which were in conflict, made the administration of medical fitness standards difficult. Under these retention standards approximately 11 to 14 per

thousand enlistees and inductees were discharged from the Army within their first twelve months of service as medically unfit for military service because of medical conditions and physical defects which existed prior to service.

For many years, the standards had been expressed in terms of acceptable and unacceptable medical conditions and physical defects. This created a grey area which resulted in varying interpretations by medical examiners. If the medical examiner had the proper regulations, he generally spent considerable time trying to find what he needed in the way of the medical fitness standards. In many instances these were written in a manner designed to make use of the medical examiner's military experience. But even these standards were inadequate, and in the case of experienced examiners the standards were a cause for differing interpretations.

The revised standards were developed after a detailed analysis and evaluation of the causes of separations for medical unfitness of recruits as well as a comparison of the Army's procurement medical fitness standards (AR 40-105 and AR 40-503) with the Army's retention medical fitness standards (AR 40-504).

In addition, the selection and retention standards for Army Aviation, United States Military Academy, overseas service, Airborne and other programs having special medical fitness standards also were analyzed and evaluated by The Surgeon General's professional consultants. For over a year, proposed drafts were circulated and carefully coordinated among these specialists before the standards were submitted for formal staffing. Recommendations also were solicited from selected experts and specialists in the field.

The newly codified standards are set forth in a new 8" x 10½" format, in loose leaf form.

In general, the overall level of

medical fitness remains the same. In some instances the expanded provisions of the revised standards will result in finding medically unacceptable some individuals who would have been acceptable under the old standards. In others, individuals considered unacceptable under the old standards will now be acceptable. The language of the standards is such that it will limit interpretations of medical findings as to the acceptability or non-acceptability of an examinee for service.

### Simplified Code

AR 40-501 has four major objectives:

- to adjust the level of medical fitness to better meet current objectives;
- to modernize the standards of medical fitness;
- to simplify the administration of medical fitness standards; and
- to increase uniformity in the medical evaluation of examinees.

These objectives are attained by changing the usual language and format of medical fitness standards so as to facilitate the user's reference to more detailed and specific standards. The Surgeon General's professional consultants were directed to base their recommendations on the assumption that all peacetime candidates for military service must be medically capable of satisfactorily completing required military training.

Particular emphasis was placed on incorporating recent advances in medical knowledge about military adaptability of individuals with certain medical conditions and physical defects. Gaps and other inadequacies in standards were resolved.

In the area of officer and enlisted procurement standards alone it was possible to reduce some 68 pages of specifications to 17 pages. An index of all medical conditions and physical defects cited in the volume is included at the end of the regulations. This is the first time that such a central

## **Army Medical Fitness Standards**

index of medical fitness standards has ever been established and published.

Chapter 1 sets forth the general provisions applicable throughout the regulation. The section on classification provides that all examinees will normally be reported as "medically acceptable," "medically unacceptable," or "medically unacceptable—prior waiver granted."

The authority to make a finding of permanent medical unfitness is defined and restricted to designated authority. In granting waivers of medical fitness requirements, the necessity is automatically established for confirming or terminating any previously granted waivers of medical fitness requirements.

Chapter 2 sets forth the medical conditions and physical defects which make an applicant *medically unacceptable* for commissioning or enlistment in any component of the Army and for induction through the Selective Service System. These standards

also apply to enlistments in the other Armed Forces. Some of the more significant changes pertain to height-weight-age tables, body build, extremities, eyes and vision, and ears and hearing.

In the tables of weight related to age and height, the number of columns has been reduced for greater ease and accuracy in use. The new tables reflect narrative changes made in 1959 to the tables contained in AR 40-503. Under these changes, medical examiners had the discretion to accept an individual for initial entry into the service who was less than 15 percent above the maximum weight shown in the prescribed tables. Under the newly codified standards, it is not contemplated to accept any individual whose weight exceeds the maximum shown in the revised tables. (See chart below.)

The latest medical judgment that relative under-weight is not of itself a valid cause for rejection has been

TABLE OF MILITARILY ACCEPTABLE WEIGHT (IN POUNDS)  
AS RELATED TO AGE AND HEIGHT FOR MALES—INITIAL PROCUREMENT

Height Inches	Minimum Regardless of age	Maximum					
		16-20 Years	21-24 Years	25-30 Years	31-35 Years	36-40 Years	41 Years and over
60	100	163	173	173	173	168	164
61	102	171	176	175	175	171	166
62	103	174	178	178	177	173	169
63	104	178	182	181	180	176	171
64	105	183	184	185	185	180	175
65	106	187	190	191	190	185	180
66	107	191	196	197	196	190	185
67	111	196	201	202	201	195	190
68	115	202	207	208	207	201	195
69	119	208	213	214	212	206	200
70	123	214	219	219	218	211	205
71	127	219	224	225	223	216	210
72	131	225	231	232	230	224	216
73	135	231	239	238	237	230	223
74	139	237	246	246	243	236	229
75	143	243	253	253	251	243	235
76	147	248	260	260	257	250	241
77	151	254	267	267	264	256	248
78	153	260	275	273	271	263	254

Note: Similar type age-height-weight tables are provided for Diving Duty, Army Aviation, and Female Personnel.

incorporated into the new tables. The minimum weights acceptable for initial entry into the service have been reduced to a single weight based on height alone and the base reduced 10 pounds.

The tables also reflect the current medical judgment that relative overweight in *older* individuals initially entering the service is not only detrimental to their overall health and well-being, but also constitutes a greater probability of liability upon the Government.

At first glance, the revised maximum weights in the younger age groups seem undesirable. However, consideration of body build enters the picture. Examinees under consideration for initial entry into the service will be rejected if their weight in relationship to bony structure and musculature is considered obesity of such a degree as to interfere with satisfactory completion of prescribed training.

Obesity is defined not in the usual sense of overweight but as excessive fat manifested by poor muscle tone, flabbiness and folds, bulk out of proportion to body build, and shortness of breath and fatigue upon mild exertion, flat feet, and weakness of the legs and lower back.

Provision is also made for rejection of the underdeveloped individual.

### Minimum Standards

MEDICAL conditions and physical defects of the extremities which interfere with walking, running, weight-bearing, or satisfactory completion of prescribed training or performance of military duty are causes for rejection on initial entry into the service. Abnormalities of the feet which preclude the wearing of combat service boots are also causes for rejection.

A functional hand concept is included. The examinee must be capable of clenching his fist, picking up a needle or pin, and grasping an object. Range of motion limitations of the extremities have been introduced to

insure that the individual has the medical capability of accomplishing necessary movements such as saluting and walking without a perceptible limp.

In the area of eyes and vision, inability to distinguish between vivid red and vivid green, inability to read newspaper print at 14 inches, any high degree of refractive errors, and ocular manifestations of significant diseases are of themselves causes for rejection for peacetime service.

Hearing standards are now based on the determination of hearing ability by audiometer rather than upon the whispered-spoken voice test. Also, otitis media, a significant lost-time-condition, has been expanded to include the history of the condition with certain associated impairment of hearing as a cause of peacetime rejection.

Among other changes of interest

Causes for rejection for neurological disorders, psychoses, psychoneuroses and personality disorders have been rewritten in language considered more easily understood by the general practitioner.

The section on skin and cellular tissue diseases has been made more comprehensive to reduce the acceptance of individuals with skin conditions which require frequent outpatient treatment or hospitalization or which interfere with the satisfactory performance of military duty.

A new section on systemic diseases has been introduced. Miscellaneous conditions which are causes for rejection have been expanded to include such things as residuals of cold injuries, predisposition to sunstroke, residuals of poisoning due to certain industrial solvents and chemicals, and persistent false positive syphilis tests.

### Retention Standards

CHAPTER 3 sets forth the medical conditions and physical defects which make an individual, regardless of component, medically unfit for further military service. These standards

## Army Medical Fitness Standards

apply at all medical examinations accomplished at any time—whether annual medical, examination for promotion, active duty for training, inactive duty training, reserve mobilization, reenlistment within 90 days of separation, or separation including retirement. (These standards, however, do not apply in determining an individual's medical fitness for Army Aviation, Airborne, Marine Diving, Ranger, or other assignments or duties which have different medical fitness standards for retention.)

The newly codified standards take into consideration the individual's medical fitness to perform satisfactory military duty; the nature, degree, and prognosis of the condition or defect; and the effect of continued service in the military environment upon the individual's health.

Most members have or acquire some physical imperfections which, although rateable under the Veterans Administration Schedule for Rating Disabilities, do not, *per se*, preclude the individual's satisfactory performance of military duties.

Lack of motivation for service in individuals possessing a condition or defect rateable in the Veterans Administration Schedule is not a cause or a basis for a finding of medical unfitness for further military service at any time, including length of service retirement or other administrative separation. Poorly motivated individuals who are medically fit for duty under these standards are to be recommended for processing for administrative disposition by commanders concerned.

Retention standards are much more detailed and specific than heretofore. Probably the most far-reaching provisions of Chapter 3 are those identifying the specific medical conditions and physical defects which, under the prescribed instructions, may be considered for continuance on duty under AR 616-41 and paragraph 11b, AR 140-120. Together with the new

medical board instructions contained in AR 40-212, November 1960, this chapter provides more uniformity and equality in the consideration of applicants for continuance. Provisions are made for modification of these standards during mobilization or as prescribed by the Secretary of the Army.

Chapter 4 sets forth the medical conditions and physical defects which are cause for rejection for selection and retention for Aircraft Mechanics, Air Traffic Controllers, Flight Simulator Specialists, Civilian Flight Instructors, rated Army Aviators and training leading to such designations as well as for participation in regular and frequent aerial flights as non-designated or non-rated personnel. These standards have been reorganized, somewhat expanded, and closely reconciled to the basic procurement standards contained in Chapter 2. Greater emphasis has been placed on the interpretation of electrocardiographic examinations, with borderline cases referred to The Surgeon General for review.

Chapter 5 sets forth the medical conditions and physical defects which are causes for rejection for admission to the U. S. Military Academy. These standards have been reorganized and somewhat expanded. Greater emphasis has been placed on conditions and defects which have been found to interfere with the individual's participation in the rigorous physical training and athletic program.

## **Mobilization Standards**

MODERN warfare requires that the Nation's manpower potential be considered in terms of the Nation's needs in all its civil and military aspects. In this connection, Chapter 6 sets forth medical conditions and physical defects which are causes for rejection under partial and total mobilization. These standards would be used only under specific instruction from the Secretary of the Army.

*Partial Mobilization* standards are based on the Army's experience with published retention standards in effect since 1953, implementing a policy of maximum utilization of personnel. These standards are much lower than the procurement standards which were used in World War II and Korea. They assure compliance with the intent of Congress with respect to manpower procurement in times of national emergency.

*Total mobilization* medical fitness standards are based on the assumption that certain so-called major impairments, such as loss of an eye, arm or leg, do not preclude individual ability to perform a military duty incident to a total mobilization effort. These standards are based on the Army's eight-year experience with the special lower standards applicable to draft physicians and dentists and approximately twenty years experience with the utilization of partially disabled personnel under AR 616-41 and its preceding directives. Such total mobilization standards will probably be most useful in the consideration of critically short specialists.

Chapter 7 sets forth the special medical fitness standards applicable to procurement and retention in Airborne, Ranger, Special Forces, and Diving Duty. Heretofore only the procurement phase of these programs was covered in fitness standards.

Also included is a reference to the medical fitness requirements for Army Service Schools, enlisted Military Occupational Specialties, and the service academies other than West Point.

### **Oversea Duty**

IN addition, Chapter 7 implements a change in policy pertaining to the medical fitness criteria for oversea duty. Effective 1 April 1961, all individuals considered medically qualified for duty in any area of the continental United States are medically qualified to serve in a similar or cor-

responding area outside the continental United States.

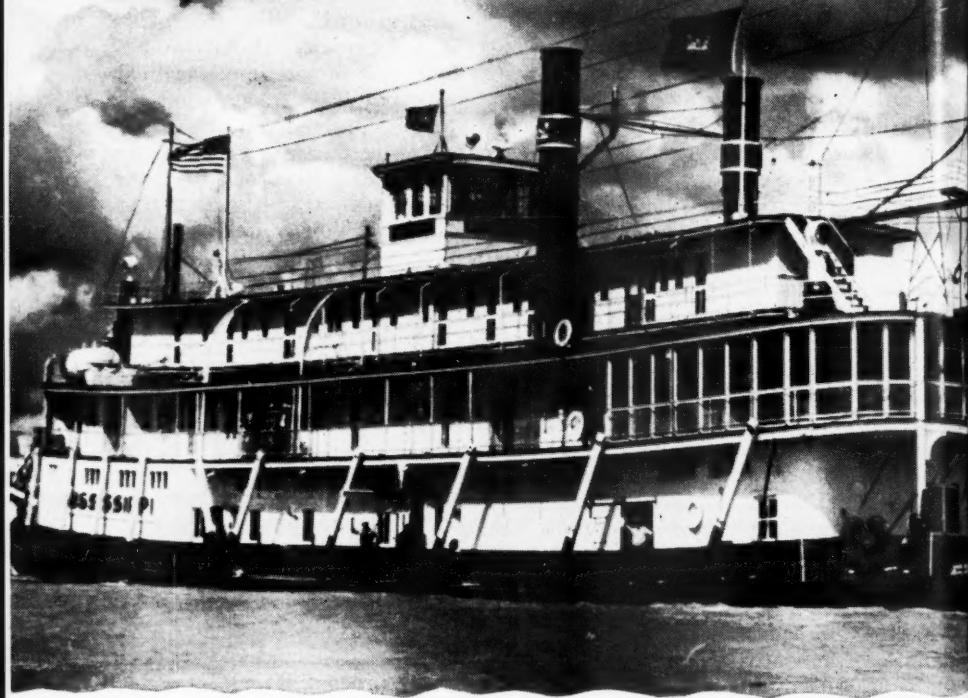
Certain individuals, especially those continued under the provisions of AR 616-41 or paragraph 11b AR 140-120, may by reason of certain medical conditions or physical defects require administrative consideration when assignment to a certain geographical area is contemplated in order to assure that they are utilized within their medical capabilities without undue hazard to their health and well-being. In many instances, such individuals can serve effectively overseas when specifically assigned on an individual basis, considering all administrative and medical factors.

These provisions supersede the present restrictions on oversea duty in the case of individuals requiring prosthetic appliances and others who over the years have acquired a no-overseaduty limitation.

Chapter 8 sets forth a reorganization and modernization of the special lower medical fitness standards applicable to all medical and dental registrants processed under the Universal Military Training and Service Act as amended. These standards revise the special lower standards which were promulgated in several 1953 letters to the extent that they provide for the rejection of individuals with medical conditions and physical defects which experience has shown to be incompatible with the practice of military medicine and dentistry.

OVERALL, Army Regulations 40-501, Standards of Medical Fitness, represents the Surgeon General's efforts to codify and modernize all of the existing instructions on a broad and exceedingly complex subject into one single, compact regulation. It represents a significant step forward in medical fitness standards that are simple and realistic for use in the evaluation and utilization of our Nation's manpower—our most perishable and valuable commodity.

**Local interests and area needs  
get a thorough hearing on this**



**T**WICE a year since 1882, on the broad waters of the river that Mark Twain made famous as a unique expression of American life, the "New England Town Meeting" idea has been put into practice aboard a stern-wheel steamboat appropriately named *Mississippi*.

Here grass-roots democracy takes the form of public hearings, with the river a common denominator in a partnership between local interests and the U. S. Army Corps of Engineers. Over the years this partnership

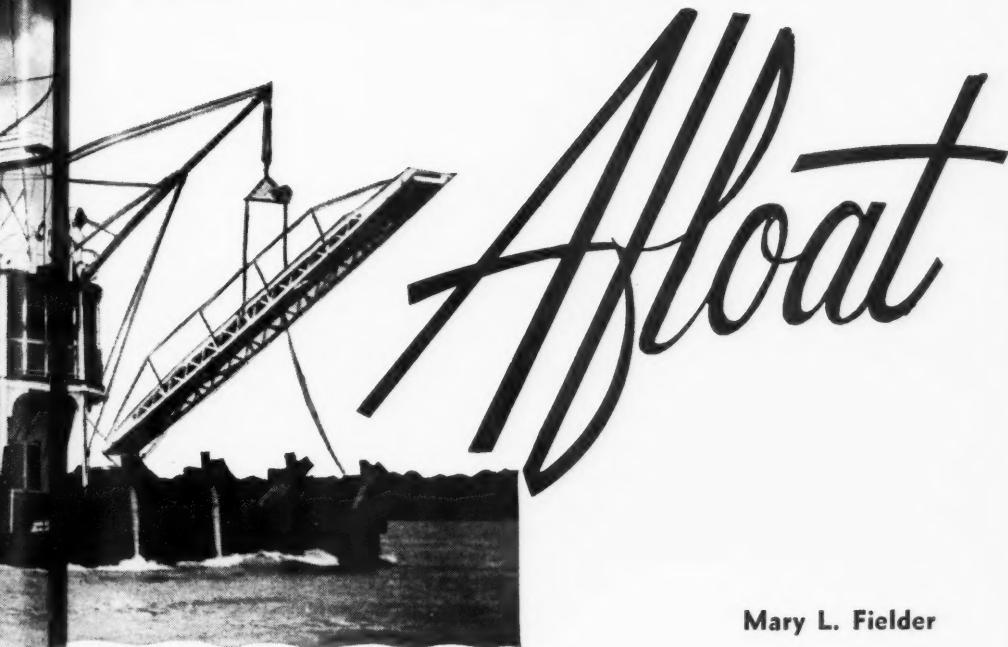
**MRS. MARY LOUISE FIELDER** is Acting Chief, Technical Liaison Branch, Mississippi River Commission and U. S. Army Engineer Division, Lower Mississippi Valley, Vicksburg, Mississippi.

has paid big dividends to the people of the Mississippi Valley and to the entire Nation.

Through it, the river has been transformed from a snag-infested, treacherous, shifting waterway that overflowed regularly into what is today a disciplined, virtually flood-free main trunk of an arterial water highway reaching from mid-America to foreign ports, moving the Nation's commerce with dependable regularity.

The Mississippi, mightiest of America's rivers, is actually a "devil in the ditch." Shifting, winding, eroding, its multi-million tons of water flow ceaselessly to the Gulf of Mexico. At Cairo, Illinois, the Ohio River and upper Mississippi join to form the

# Town Hall



Mary L. Fielder

lower Mississippi, a river giant which drains 41 percent of the contiguous United States—all or parts of 31 States and two Canadian provinces.

A seven-man Mississippi River Commission was created by Act of Congress in 1879 to harness and improve the lower Mississippi, to make its valley safe from floods and develop the river as a strong navigation artery. The Commission, appointed by the President and confirmed by the Senate, is composed of three officers of the U. S. Army Corps of Engineers, one of whom serves as president; a representative of the U. S. Coast and Geodetic Survey; and three civilians, two of them civil engineers.\*

Each spring during the high-water

season and again each fall in low-water, the Commissioners make a thousand-mile inspection trip down-river aboard a floating "town hall."

\*Now in its 82d year of working to shackle a restless river, the Commission's present members are: Maj. Gen. T. A. Lane, USA, President, Vicksburg, Mississippi; Mr. DeWitt L. Pyburn, civil engineer, Baton Rouge, Louisiana; Mr. E. F. Salisbury, civil engineer, Kansas City, Missouri; Rear Adm. H. Arnold Karo, Director, U. S. Coast and Geodetic Survey, Washington, D. C.; Mr. Harry L. Bolen, Cairo, Illinois; Brig. Gen. W. W. Lapsley, USA, Division Engineer, U. S. Army Engineer Division, Ohio River, Cincinnati, Ohio; and Brig. Gen. William R. Shuler, USA, Division Engineer, U. S. Army Engineer Division, Missouri River, Omaha, Nebraska.



Memphis city engineer addresses Commission as others wait turn to speak in a typical business session aboard *Mississippi*.

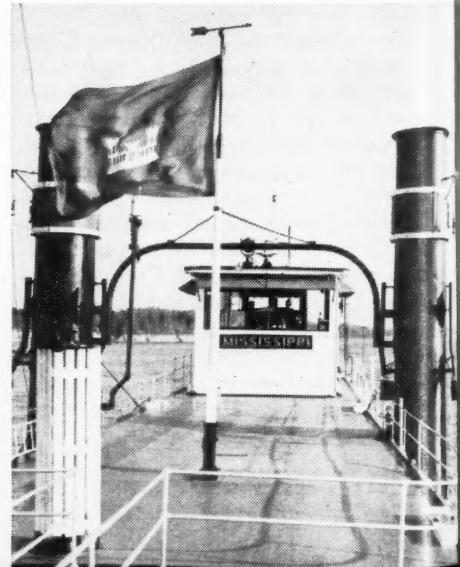
Beginning in 1882, paddlewheel steamboats have been used for this purpose. The present steamer *Mississippi*, queen of the Texas-deck, sternwheel towboats and last of her kind operating on the lower Mississippi River, has served as inspection boat and meeting-house since 1927.

This boat, the third of a distinguished line to bear the same name, has served as a towboat during the

working season when construction of flood control and navigation improvements is under way and as a rescue boat during floods.

While her outward appearance, typical of a hundred years ago, has been preserved, major mechanical improvements have kept pace with changing conditions through the years. With a conservatism that gladdens the heart of the American taxpayer,

Captain David M. Cook takes river steamer *Mississippi* into a port where the Commission will conduct hearing. Right, view on Texas roof of old vessel, looking aft.



the Engineers have, wherever practicable, kept her original equipment in operation. The refrigerating plant, for instance, installed on her predecessor in 1908, still operates 24 hours a day.

Measuring 220 feet in overall length, 39 feet across the beam and drawing 7 feet, 8 inches, and with 850 horsepower, she is a "big" boat. During river inspection trips the *Mississippi* has gallantly acted as hostess to passengers enjoying her gleaming staterooms, while at the same time often pushing as many as 16 barges before her workhorse bow. She has had her moments of distinction, too, with Senators, Congressmen, Assistant Secretaries of the Army, Chief of Engineers, State Governors, and other high-ranking officials aboard from time to time.

But this year the old steamer has reached retirement age and condition and will be replaced by a modern diesel towboat, also to be called *Mississippi*. The inspection trips will continue to be made with public meetings aboard, as usual.

The 1,000-mile "river road" inspection trips make the riverfronts of the public-hearing towns come alive as people board the vessel to take part in the proceedings, as speakers or just as interested listeners.

Farmers, industrialists, small businessmen, shippers, representatives of city governments, civic organizations, the levee boards and drainage districts (which are the legally constituted

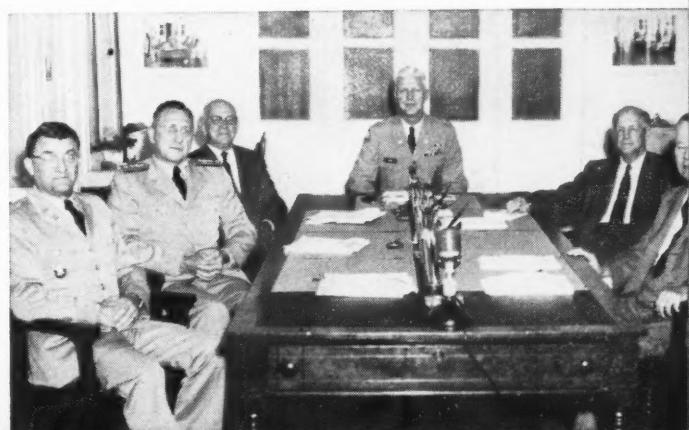
agencies of the States responsible for maintenance, for providing rights-of-way and sharing costs), and interested individuals, meet with the Commission for an exchange of ideas on work under way or proposed.

At an appointed hour at each stopping point, the Commission President gives an informative introduction and the meeting begins in the towboat's hearing room. Questions of construction and maintenance arise. Problems concerning revetment, levees, rights-of-way, and many other subjects are threshed out across the conference table. The Commission takes the knottier problems under consideration in executive sessions en route and advises the officials of its decisions by letter upon completion of the inspection trip.

Constructing Congressionally-authorized projects entails the work and cooperation of many interests, individuals, and organizations. These "town hall afloat" meetings, designed to keep the affected interests working together in close partnership, are a wellspring of ideas where questions of mutual concern and common hope are discussed. Out of this partnership has come successful flood protection for the Mississippi Valley.

A symbol of the democratic process in action, the stately *Mississippi* towboat has brought together area and local interests to give unity and purpose to the Corps of Engineers unrelenting efforts to channel the river into the ways of peaceful commerce.

Presiding at a recent low-water inspection trip meeting is Brig. Gen. T. A. Lane, at head of table.



**Three stages of solid-propelled  
firepower make up the**

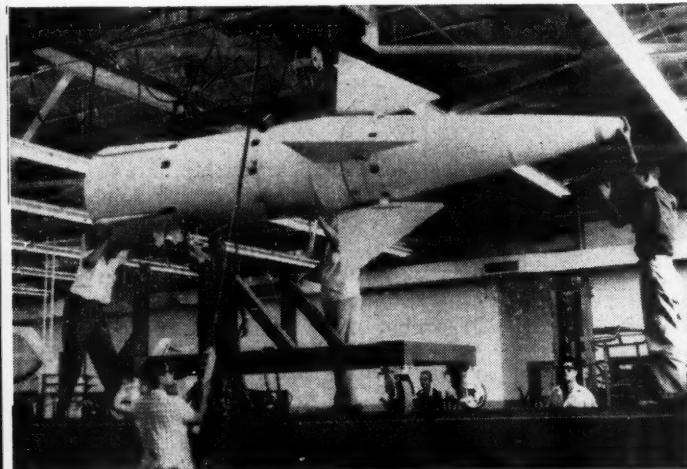
## **Nike Zeus Assembly**

THREE stages of the advanced configuration of the U. S. Army's Nike-Zeus are shown here being assembled to form the anti-missile missile which is currently undergoing research and development firing tests at White Sands Missile Range, New Mexico.

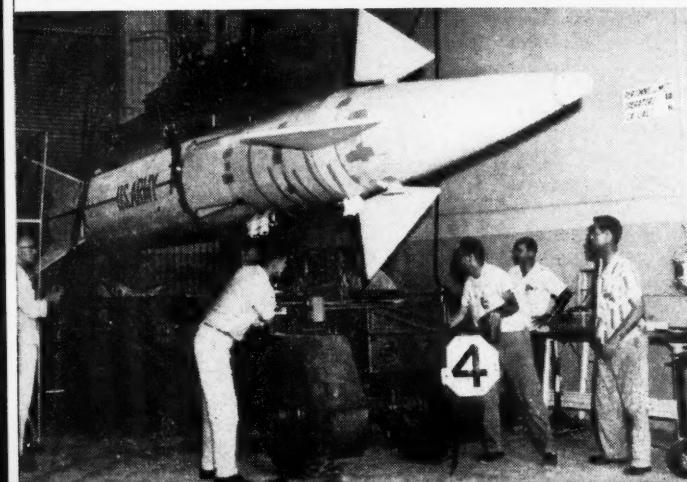
Further firings will be conducted at Pacific Missile Range Headquarters, Point Mugu, California, later this year

in preparation for full system demonstration which will match the Nike-Zeus and its detection system against targets supplied by Air Force Atlas ICBMs.

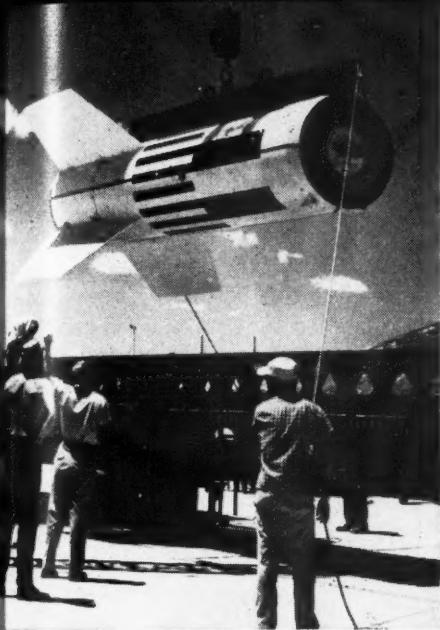
Western Electric Company is prime contractor for Nike-Zeus; Bell Telephone Laboratories is responsible for system design and development; and Douglas Aircraft Company builds the missile.



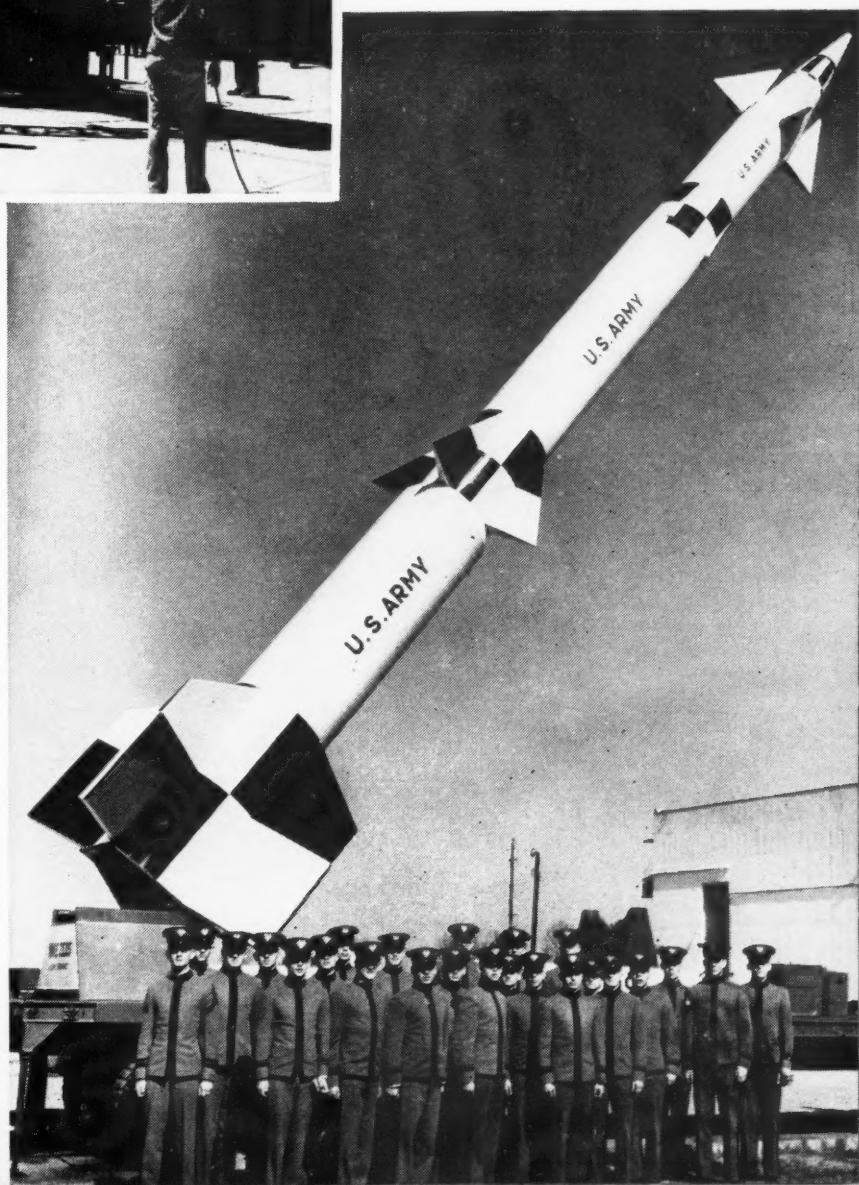
The third stage, with prominent forward fin surfaces, is set for mating with second stage after checkout.



Then the two stages are loaded aboard a handling trailer to be hauled away to a test firing site.



At the firing pit, left, final assembly is made while, below, Cadet members of West Point Rocket Society view unit.



*In simple dignity,  
the American Battle Monuments Commission  
maintains the resting place of*



# The Silent Host

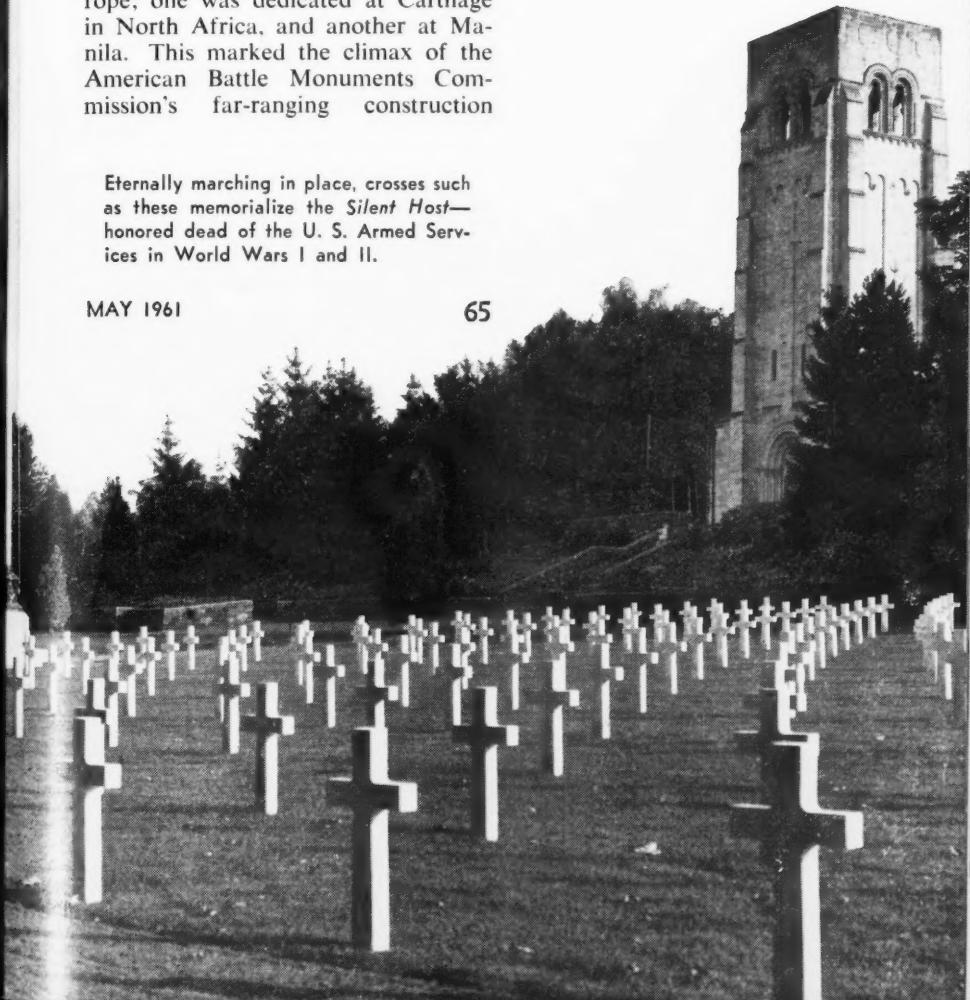
Major General Thomas North

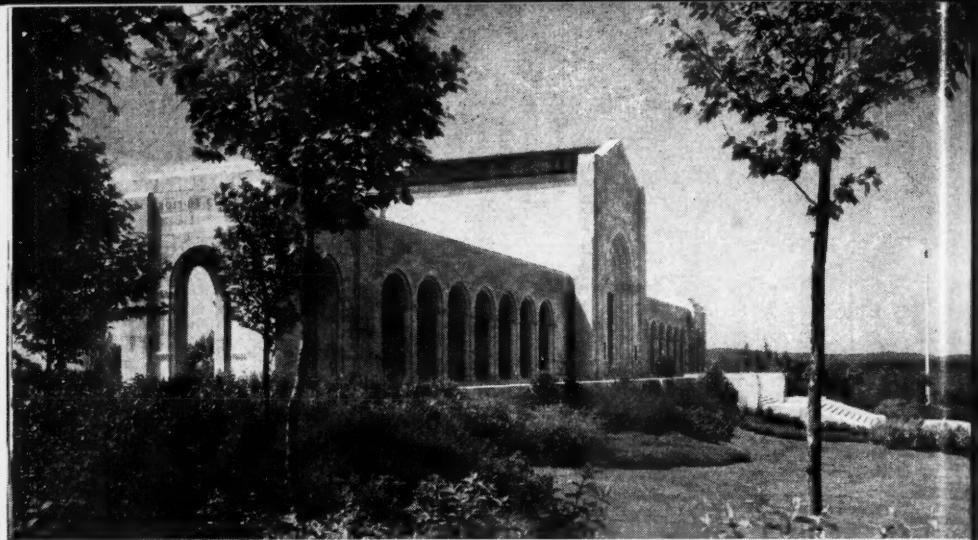
DURING the second half of 1960, six World War II cemeteries with their memorials were dedicated in Europe; one was dedicated at Carthage in North Africa, and another at Manila. This marked the climax of the American Battle Monuments Commission's far-ranging construction

Eternally marching in place, crosses such as these memorialize the *Silent Host*—honored dead of the U. S. Armed Services in World Wars I and II.

MAY 1961

65





Overlooking battlefields of the great Meuse-Argonne offensive of World War I, this beautiful and imposing memorial chapel is hallowed ground to visitors from all over the world.

program. Today all fourteen of the contemplated World War II cemeteries have been virtually completed.

The dedicatory ceremonies were impressive. Some were attended by the Chiefs of State of the host countries; to all came distinguished representatives of the United States Government, while honor guards, color guards, and bands of the Armed Services and of our Allies lent appropriate dignity.

During 1960 also the Commission dedicated its monument to the Missing at the Presidio of San Francisco, commemorating those who lost their lives in the Pacific coastal waters of

North, Central and South America. With particular pride, it also dedicated the naval monument which it built at Brest, a replica of that which was erected in 1930 to commemorate the achievements of the United States Navy and which was wantonly demolished by the Nazis months before United States entered the war in 1941.

#### Thousands Memorialized

THE Commission maintains the eight cemeteries of World War I in Europe with their 30,912 graves as well as ten monuments which it built on the battlefields of that war, and at Brest and Tours in France.



Major General Thomas North  
Secretary,  
American Battle Monuments Commission

The fourteen cemeteries of World War II shelter the remains of 93,134 former comrades in arms, and upon the walls of the memorials in these cemeteries are recorded the names of 55,581 who were Missing in Action or lost or buried at sea.

To complete this phase of the program, the Commission expects to dedicate—perhaps next year—its memorial in Battery Park, New York, erected to the memory of those 4,596 missing in Atlantic coastal waters. Some two years from now the Commission will complete and dedicate the memorial which it is building in the Army-operated cemetery in Honolulu where the names of an additional 26,280 Missing of World War II and Korea are inscribed.

Visitors to these cemeteries are always impressed by their beauty and dignity, as well as by their immaculate maintenance. The graves with their white headstones represent roughly 40 percent of those whose bodies were recovered. The remaining 60 percent were repatriated soon after the war at the request of their next-of-kin. A closely similar proportion was repatriated after World War I.

Altogether, 106,602 American comrades in arms rest in the Commission's 14 overseas cemeteries and in three

others which are maintained by the Memorial Division of the Office of the Quartermaster General. Of this number, 8,474 headstones mark the graves of Unknowns.

In charge of each of the cemeteries is an American veteran, sometimes with an American assistant. These devoted superintendents are always eager to assist servicemen and other visitors.

### Architectural Beauty

THE memorials of World War II, as well as those of World War I, were designed by American architects, chosen with the greatest care. Upon the application of their talents the Commission placed few restrictions other than that each memorial must contain a small devotional, non-sectarian chapel; that upon its walls were to be recorded the names of the Missing in that region; and that each was to contain a chamber in which the achievements of our Armed Services were to be graphically and permanently recorded.

The realization of the chapels has been most varied—sometimes austere, sometimes with mural and stained glass decorations but always with piety and awareness of the personal tragedy of each of the relatives who seat themselves before the altar.

Permanent maps in various media tell the visitor of action that occurred nearby, such as this one showing military operations in Northwest Europe.





The numbers of the Missing have varied, depending upon the location of the cemeteries and their geographic relation to the battlefields, from 293 at Draguignan in southern France to 36,279 at Manila. With each name is inscribed the man's rank, organization, and state, and because these names are written in stone, it is understandable that by their very numbers they have influenced the design of these memorials. These leave a deep impression, as once aptly phrased by General Pershing—"a place of sacred rendezvous of a grateful people with its immortal Dead."

#### Battle Maps

OF GREAT interest to military visitors and others are the battle maps. These deserve some background explanation. Soldiers of all other nations and of all ages have the very human urge, when the battle is over, to build a monument not only to their own achievements but also to commemorate their comrades who have fallen. Unfortunately and understandably, these are rarely substantially built, and they are apt to fall into decay.

Accordingly immediately following World War II, the War and Navy Departments issued instructions discouraging the building of such monuments, adding the promise that the Government would see to it that the achievements of all would be adequately and appropriately commemorated. Thus it is that the Commission is keeping faith with this promise.

In each of the fifteen cemeteries and memorials, including Honolulu, large maps in permanent form portray the military operations in that particular region as well as the course of the war in the theater of operations.

In no two cases are the maps executed in the same medium. The

Names of servicemen missing in action will live forever, carved in the stone of chapel atrium in Florence Cemetery.

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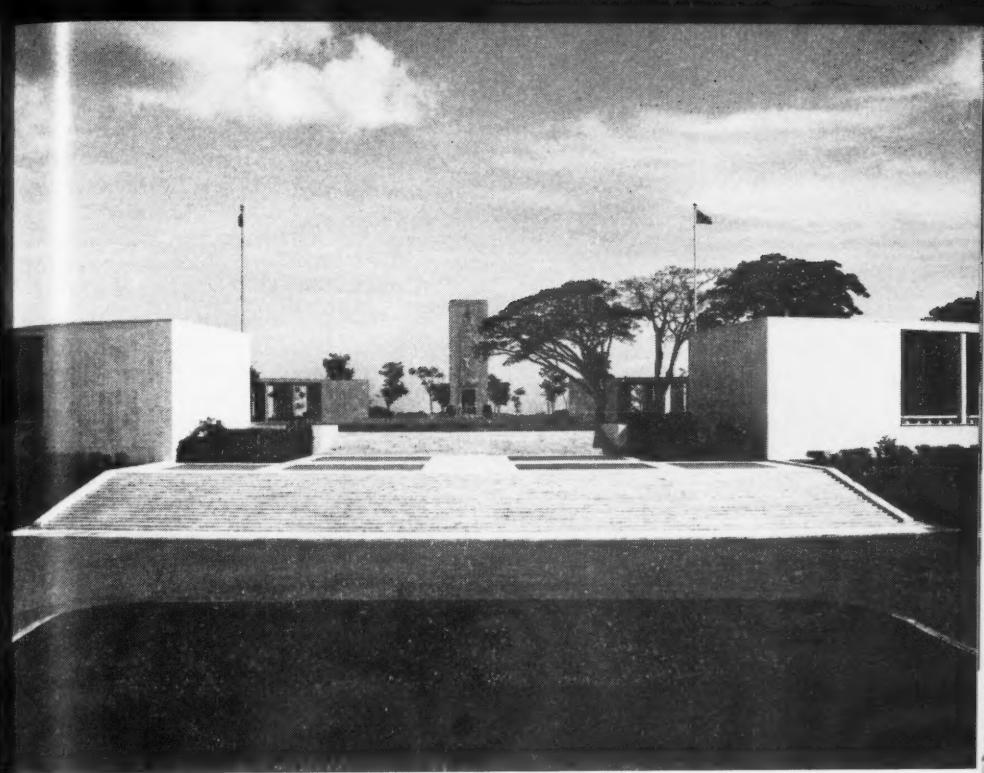
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Names of 36,000 missing in World War II are inscribed in Manila cemetery, above, and impressive statue below dominates Normandy Cemetery at Omaha Beach.





Cemetery at Epinal is typical of five in France that hold dead from World War II.

visitor, for example, will find them in bronze relief, perhaps incised in stone with bronze and enamel appliques, or painted in true fresco (with colors mixed with plaster), in inlaid marbles, mosaic, or ceramics. Each map and its explanatory texts has been carefully worked out by the Commission, and submitted to each of the Armed Services to ensure that the portrayal is accurate, well-balanced, complete.

Following approval, the drawings are turned over to a distinguished artist who reproduces them in a tasteful manner for fabrication in permanent materials. No such program on such a scale has ever been attempted before; in most instances the Commission has pioneered this type of commemorative art.

#### Area of Operation

THE American Battle Monuments Commission is a truly representative group; distinguished soldiers, sailors, airmen, civilians have taken part in its policy-making.

The Commission's responsibilities cover a wide area. From its Paris Office it administers two cemeteries in England—Brookwood (World War I) and Cambridge (World War II); and in Holland, the World War II cemetery at Margraten near Maastricht.

In Belgium, there are the World War I cemetery at Waregem, the small monuments at Vierstraat south of Ypres and Audenarde, as well as the two World War II cemeteries at Henri-Chapelle, east of Liège, and to the south of that city at Neuville-en-Condroz. The memorial in Neuville cemetery includes commemoration of the achievements of the Services of Supply in World War II. In Luxembourg the Commission is responsible for the cemetery just east of the capital city.

In France, there are World War I cemeteries at Bony south of Cambrai, with its nearby monument at Bellencourt recalling the breaching of the Hindenburg line; Belleau Wood with its related monument at Château-Thierry; Fère-en-Tardenois; Romagne north of Verdun and the monuments at Montfaucon recalling the great Meuse-Argonne battle, and at Somme-Py; Thiaucourt east of St. Mihiel and the monument on the crest of Montsec; Suresnes just west of Paris.

In addition there are the World War I monuments, to the first major attack by an American unit—the 1st Division—at Cantigny; to the Services of Supply at Tours; and to the Navy at Brest.

In France, too, there are five World

War II cemeteries—Normandy (Omaha Beach), Brittany (St. James, south of Avranches), Lorraine (St. Avold, east of Metz), Épinal, and Rhône (at Draguignan near the Mediterranean coast)

The Commission's Rome Office is responsible for the maintenance of the cemeteries south of Florence and at Nettuno, as well as that at Carthage in Tunisia, the only American military cemetery in North Africa.

The Manila cemetery, the East and West Coast Memorials already mentioned, and the construction of the Hawaii Memorial, are administered directly from the Washington Office. This Office also is responsible for the maintenance of the Mexican War cemetery in Mexico City and for the Surrender Tree Site commemorative of 1898 near Santiago, Cuba. The Commission's World War I monument at Gibraltar to U. S. Naval achievements is maintained by the local government.

Such wide geographical relations enable the Commission to utilize the artistic specialties and craftsmen of one country for embellishing its me-

moriais in another region or theater.

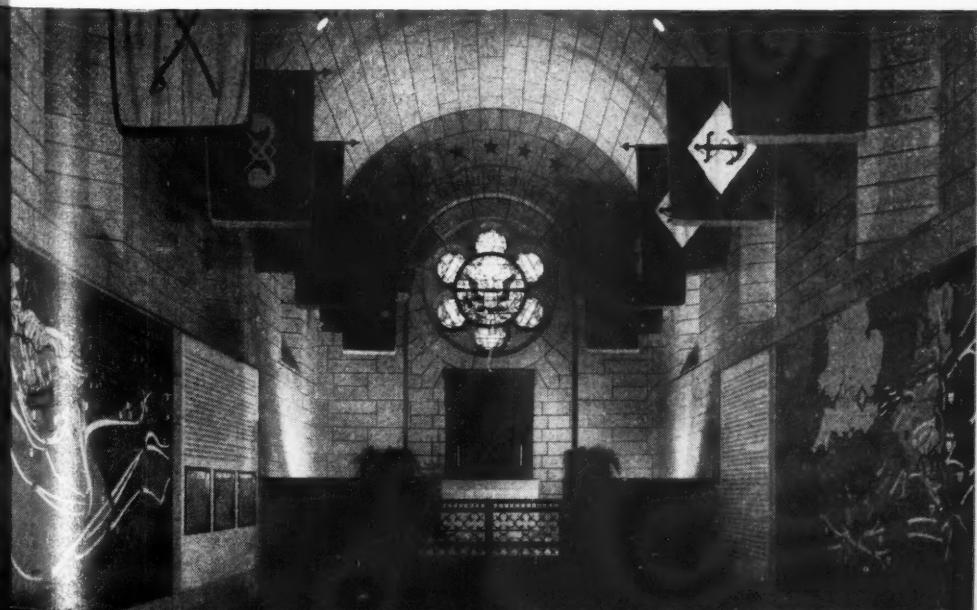
### Perpetual Tribute

IN THE burial areas at the cemeteries, the broad lawns with their stately rows of white marble headstones framed in masses of foliage and flowers are witnesses to the honor in which our fallen comrades are held by their Government. The whole atmosphere is one of dignity and peace.

To the multitudes of foreign visitors they bring the reminder that the people of the United States gave much; that our soldiers, sailors, marines, and airmen laid down their lives in all quarters of the earth that other peoples might be free from oppression.

For the relatives of those who rest there, or whose memory is enshrined in the lists of the Missing, there is consolation in the realization that long after our own generation has passed, and as long as the United States of America exists, these magnificent shrines will be maintained in proud memory of the achievements of her sons and in grateful tribute to their sacrifices.

Each memorial contains a specially designed devotional, non-sectarian chapel, as typified by this interior view at Brittany Cemetery at St. James, France.



**Fifteen years of work  
by Quartermaster Research and Engineering Command,  
backed up by modern electronic devices, help insure**

## **Uniformity in Uniforms**



**Frank J. Rizzo**

**G**ONE are the days when a soldier buying a uniform had to take the jacket and trousers outdoors to be sure that the shade matched with some degree of exactness. Today he can select his uniform under artificial light and be concerned only about fit. He can be sure that the components—if they bear an approved certification—will match within acceptable standards, even though they might have been made from separate bolts of cloth.

*FRANK J. RIZZO is on the staff of U. S. Army Quartermaster Research and Engineering Center, Natick, Massachusetts.*

To be certain of its acceptability, however, the item must bear a certification stating "This uniform conforms to Army Regulations and is equal to or better than required by specifications issued by the Quartermaster General."

SOME fifteen years of intensive research, developing and testing by the Quartermaster Research and Engineering Command have culminated in the development of an automatic device designed to make color measuring a foolproof process.

The device itself is the result of

long and intensive work. It was developed under Quartermaster Research and Engineering Command with Macbeth Corporation, Newburgh, New York, and was designed by Hunter Associates Laboratory, Inc., of McLean, Virginia. It is based on an earlier model of a Color Difference Meter invented by Richard S. Hunter, formerly of the National Bureau of Standards, and modified by the Quartermaster Corps for its specialized use.

Use of this new device will mean that the exacting processes of color control, now based on visual processes by expert "color shaders" under standard lighting, can be even more closely exercised.

AMONG research problems given special consideration are methods of insuring uniformity of shade within any run of cloth, and of matching coats and trousers to give an appearance of uniformity between uniforms worn by different individuals.

Variations in shade in textile fabrics are an everyday occurrence, due to many factors. These include the fact that yarn making and weaving machinery are not all exactly the same; waters used in dyeing and other operations will vary and thereby influence shade and general fabric appearance; fibers do not have the same properties, lot on lot, with respect to dyeing and finishing properties; and often control of the finishing operations on shade is not precise enough to guarantee reproducibility.

In addition to these problems, dyeing is still very much an art, and has not progressed to the point where the same shade can be guaranteed in successive operations. Control of shade is dependent on the skill and experience of the dyer.

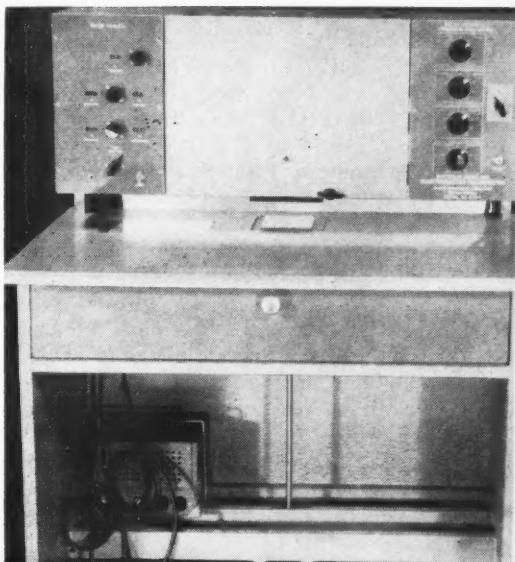
Thus even the same fibers, woven

Modern electronics methods are used in this automatic color difference meter designed to measure minute values.



Today Army members can be sure that components of the uniform will be properly matched.

in the same mills and processed in the same plants, may not come out the exact same shade in different runs. When various fibers are woven in different mills and processed in different plants, the problems encountered in securing exact shadings are compounded.





ARMY GREEN—Enlisted



SHADE M-1—Optional



OLIVE GREEN FIELD UNIFORM

### Maintaining Standards

UNLESS careful control of color is maintained, there may be variations in a single garment made from different bolts of cloth. Since uniforms are frequently made as separate coats and trousers, very close tolerances must be set up to exercise shade control.

These tolerances establish the maximum extent to which a manufacturer's product can deviate from the standard shade and still be considered acceptable. The Quartermaster Corps has furnished tolerances for more than 400 separate shade standards, with a minimum of eight tolerances to each shade. More are being added constantly.

In addition, the shade standard itself has been dyed to give the required color-fastness and is used as a reference both for color-fastness and for shade and finish. It is in this area that the new color measuring machine will be of greatest value, for it can measure differences in shade much more quickly and closely than the human eye.

The tolerances permitted to the clothing industry are aimed at achieving the effect of the same shade of cloth at reasonable troop inspection

distances, within tolerances that the industry can meet in normal production. The range thus depends on what is feasible and what is economical under the mass production conditions that the military services require in order to have sufficient uniforms for the troops as needed.

### Individual Care

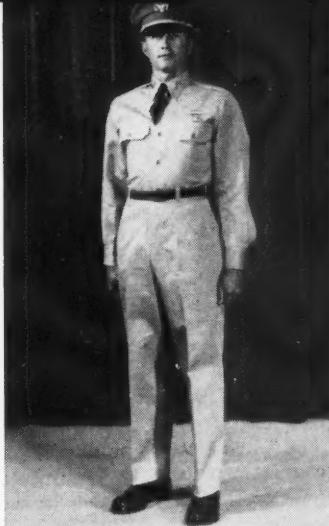
WHILE the Quartermaster Corps makes every effort to provide for uniformity in uniforms, the individual wearer should remember that the care and handling of his clothing will have considerable effect on his appearance.

Even when an exact match exists between coat and trousers at time of purchase or issue, it is recognized that generally the trousers will require dry cleaning and pressing more often than the coat.

Even where only pressing is involved, the fabric acquires a shine. Surface hairs are flattened and there is possibility that a shade change may result because the dyes will be affected by moisture and heat. Add to this the effect of soiling, and of the dry cleaning fluid used, and the tendency of dyes to dissolve in the solution, and a change of shade may well



ARMY TAN



ARMY TAN



ARMY GREEN—Officer

result. Thus a uniform may end up as two different shades.

Add to this the possibility that a replacement pair of trousers may be added and the individual faces further complication in maintaining a matching uniform.

### Design Changes and Controls

THE Quartermaster Corps is not only deeply involved in uniforms, their fit and their color, but it constantly recommends to the Army Uniform Board actions to fulfill to a greater degree the suitability of uniforms for the purposes intended.

As an example, when the Army Uniform Board announced a program to improve uniform design, the Quartermaster Corps presented samples in four different designs, each in four fields of color, and in some 20 different shades. From this came the final selection of the Army Green uniform, for which the Corps developed shade standards and tolerance ranges so technically adequate that it permitted the procurement from separate suppliers of coats and trousers for both Army Green and Army Tan uniforms.

Following the major policy decision of the Army Uniform Board to sepa-

rate uniforms worn in the field from those worn on the street, the Quartermaster Corps recommended fabrics and garments of new design and new concepts, which were adopted by the Board. Outstanding was the change of street uniform from the Eisenhower jacket to the coat-style garment.

In other areas, the Corps first recommended short-sleeve shirts for summer comfort. They now are authorized with both cotton and tropical worsted uniforms. The Corps also recommended authorizing lighter weight fabrics for optional winter wear.

In response to the Uniform Board's desire for high quality uniforms, standards were established by the Quartermaster Corps through specification upgrading which have resulted in Army Green, Army Tan and Army White uniforms reflecting higher quality of workmanship and materials. These qualities have also been established for component uniform garments.

By utilizing all available methods, from specification changes to electronic color controls, the Army Quartermaster Corps assures a continuing standard of excellence and uniformity in uniforms.

*From desert sands to northland tundra—*

## **STRAC Exercises—1961**

CALENDAR YEAR 1961 finds the Army's Strategic Army Corps (STRAC) participating in eleven exercises designed to demonstrate its ability to cope with limited war actions and large-scale combat in a variety of climates and terrain.

Exercises already held or planned for the year:

**SWIFT STRIKE**, a 15-day Corps exercise, scheduled for August-September 1961, in the Fort Bragg-Fort Campbell areas, with participation by some 30,000 troops from the XVIII Airborne Corps, 82d and 101st Airborne Divisions and selected Corps support units.

**GREEN BANK**, a 10-day mobility exercise for a 2,200-man task force, scheduled in October to demonstrate deployment capabilities of STRAC units.

**SEA WALL**, a 10-day, special training exercise scheduled for October-November, for training units and staffs in joint amphibious operations on the West Coast. Approximately 7,000 troops will participate.

**DENNING SPRING**, a California desert maneuver, held February 24-March 2; **OPERATION SOLIDARITY**, a maneuver in Panama, March 1-4; and **CHANNEL REEF**, a 10-day mobility exercise planned for April in an oversea area.

Other recent exercises include:

**GRAND ISLE**, a mobility exercise scheduled during April-May in an as yet undetermined oversea area. **THUNDER BOLT**, a 15-day exercise at Fort Hood, Texas, in April 1961. **MOHAWK ARROW**, a 15-day task force exercise,

at Fort Drum, New York, in May. **LAVA PLAINS**, a 15-day maneuver involving approximately 17,000 troops at Yakima, Washington, in May.

**WILLOW FREEZE**, a major STRAC exercise held in Alaska in February, emphasized training in winter combat operations in a primitive area.

TYPICAL of the STRAC activities was **EXERCISE DENNING SPRING** which ended 2 March at Camp Irwin, California, after seven days of field action which included simulated atomic explosions, gas attacks, regular and chemical minefields, attacks and counter-attacks by aggressor. This was an armored reconnaissance over extended distances with emphasis on tactics and techniques of desert operations. The U. S. Air Force cooperated in the maneuvers, with RF 101 Voodoo jets flying photo reconnaissance.

Action began in the southern part of the Camp Irwin reservation with U. S. forces, represented mainly by 2d Reconnaissance Squadron, 8th Cavalry, 4th Infantry Division, in pursuit of Aggressor, played by 5th Medium Tank Battalion, 40th Armor.

A gas attack and a searchlight tank attack were staged the first day and night. A simulated atomic explosion highlighted the second day while minefields were employed on the third. More simulated nuclear explosions, chemical minefields, attacks and counterattacks featured the final four days, which finally saw the entire Aggressor force except two platoons wiped out by a "nuclear explosion."

# NEWS

## of professional interest

### **Under Secretary Manpower Role**

The area of Manpower, Personnel and Reserve Forces in both the Army and Navy will be the personal responsibility of the Under Secretaries of the respective services, it has been announced by the Department of Defense. Commenting on this, Secretary of Army Elvis Stahr, Jr., stated, "The assignment of this responsibility to the Under Secretary of the Army will allow for more efficient and closer top-level supervision of the Manpower, Personnel and Reserve Forces Program, thereby giving its needs and mission renewed emphasis in the Army's overall planning."

### **Building with Foam**

A building 16 feet wide, 24 feet long, 9 feet high, weighing 552 pounds, has been built of plastic foam contained in one 55-gallon drum in an experiment in "building in barrels" that may prove an answer to one of the Army's logistics problems. Now the subject of a feasibility study at the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia, this concept envisions shipment of barrels of liquid plastic, each capable of being expanded to form a building or segment thereof. At the construction site, the chemicals can be mixed to form a rigid building material of plastic foam.

The experimental building is a panel type, each panel being formed in place in molds somewhat similar to a metal casting. Though it can be reinforced in several ways, the most promising method is to spray with polyester or epoxy fiber-glass resin. Besides saving on shipping space, final building costs are low under this concept.

### **First Aid Kit Under Test**

Now being tested by all services, a new first aid kit reflecting advances in modern medical thinking will replace the existing Army first aid kit if adopted. The kit measures 8x2x4 inches, weighs about a pound and can be attached to a standard pistol belt. Its two water and weather-proof packets can be opened by an injured person easily and quickly, even when wearing gloves.

One of the packets can be used by the individual, the other to take care of a fellow soldier. The first packet contains first aid dressing, adhesive bandage, iodine water purification tablets. The second contains sodium bicarbonate to be taken by mouth in case of burns, absorbent adhesive bandage, first aid dressing, muslin bandage, and more purification tablets.

### **U. S.-Canadian Missile Research**

Problems incident to ballistic missile defense are being investigated by joint research teams from the U. S. Army Rocket and Guided Missile Agency and the Canadian Defense Research Board, with the United States establishing a liaison team at the Canadian Armament Research and Development Establishment (CARDE). Major fields of research involve aerophysics, infra-red studies and propulsions.

Test facilities provided by the Canadians include indoor ranges that permit study of model ICBM nose cones in flight, and also simulate atmospheric conditions encountered by a missile leaving or re-entering the earth's atmosphere. Close liaison in exchange of scientific knowledge and cooperation in use of facilities have permitted substantial savings in effort and funds for both countries.

## **Multi-Purpose Tractor**

A multi-purpose crawler tractor capable of use as scraper, grader, cargo carrier, dump truck or high speed prime mover is being tested by the U. S. Army Engineer Research and Development Laboratories, Fort Belvoir, Virginia. The new tractor is both air-droppable and amphibious. Called the "Universal Engineer Tractor (UET)" it is light but still able to perform work of heavy earthmoving equipment by means of a self-loading ballast bowl or compartment which when filled with dirt doubles its weight to provide the maximum drawbar pull of 17½ tons. It is powered by a 250 horsepower gasoline engine in the rear. The experimental model was built by International Harvester Company, Melrose Park, Illinois, under contract.

## **Army Salutes Industry**

More than 60 local and national firms participated in the "Army Salutes Industry" spring meeting of the Virginia Peninsula Chapter of the Association of the

U. S. Army staged in March at Fort Eustis. Business and civic leaders, senior commanders and representatives of the Navy and Air Force attended the two-day show, along with thousands of residents of nearby cities. They heard speakers headed by Lt. Gen. Arthur G. Trudeau, Chief of Army Research and Development, and witnessed displays ranging from food to ship models. Supporting the Army-Industry showing were the area's joint Chamber of Commerce and Peninsula Industrial Committee.

## **Special Warfare Center Head**

In line with increased Army emphasis on guerrilla and anti-guerrilla training programs, the United States Army Special Warfare Center, Fort Bragg, North Carolina, will be commanded by a general officer. Colonel William P. Yarborough, commander of the center, has been nominated for promotion to the grade of brigadier general, and will continue in his present assignment.

### **Over-the-beach in the dark**



USING infra-red and other night-viewing equipment, this U. S. Army Composite Transportation Battalion recently crossed an 80-yard-wide beach in 23 minutes in total darkness. The unit accomplished the resupply exercise during a triphibious demonstration of the Transportation Corps logistical-over-the-shore concept which called for dispersed units to operate independently in isolated beach areas. In front row may be seen the task force with a 4-man swimmer reconnaissance team at left; 2½-ton truck hauling thousand-gallon rolling liquid transporter; bulldozer, jeeps, armored personnel carriers, a LARC-5; DUCWS, a LARC-15, a 20-ton crane, two 60-ton BARCs and miscellaneous cargo and personnel carriers.

# Freedoms Foundation Army Award Winners

TWO Army members were top award winners in the Valley Forge Patriots' Awards for letters from Armed Forces personnel in the twelfth annual awards of Freedoms Foundation. They were Pfc Ernest N. Vanover, 184th U. S. Army Security Agency Company, APO 171, New York, winner of \$1,000 and an encased George Washington Honor Medal; and Pfc Timothy J. Chwala, Headquarters Company, USAG, Fort Ord, California, winner of \$500 and a George Washington Honor Medal Award.

In addition in this category 20 other Army members were awarded \$100 and George Washington Honor Medals; 22 received \$50 and George Washington Honor Medals and 18 received medals.

Award of a George Washington Honor Medal went to The Honorable Wilber M. Brucker, former Secretary of Army, for his article "The Secretary Replies" which was published in

the March 1960 ARMY INFORMATION DIGEST. The award winning article was written to members of the sixth grade class of Ridge Ranch School, Paramus, New Jersey, who asked "What are some things young Americans like ourselves can do to build a stronger America?"

Another medal went to the U. S. Military Academy for its Eleventh Student Conference on U. S. Affairs and its Fourteenth National Debate Tournament. The award was in the Thomas Jefferson category for college campus programs.

In presentations for radio programs, the Military Personnel Procurement Division, Department of the Army, received a medal for its weekly series, "Topics of Conversation," carried on the Mutual Broadcasting System. The Office of Chief of Information, Department of the Army, also received a similar award for the "General Pershing Story" on its Army Hour series, also on Mutual network.

**For your convenience, you may send the Digest home . . .**

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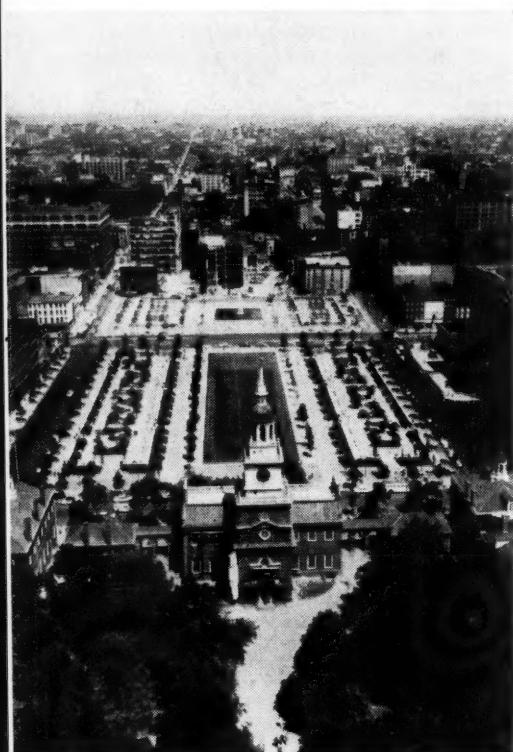
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*In the shadow of Independence Hall . . .*

# Museum to commemorate Army birthplace



Near history-steeped Independence Square, museum will be built commemorating U. S. Army origin.

The museum will commemorate the events of the Revolutionary era from 1775 to 1800. Colors, regimental flags, and other relics telling the story of the Army during the Revolutionary War will be installed.

It was on 14 June 1775 that the Continental Congress, answering pleas for assistance from Massachusetts patriots in their struggle against the British, adopted a resolution authorizing six companies of expert riflemen. Next day George Washington was selected as general and commander in chief of the new organization. In the same room in 1776 the Declaration of Independence was adopted.

A PROPOSAL to mark the actual birthplace of the Army was adopted at the 1959 Annual Meeting of the Association of the United States Army.

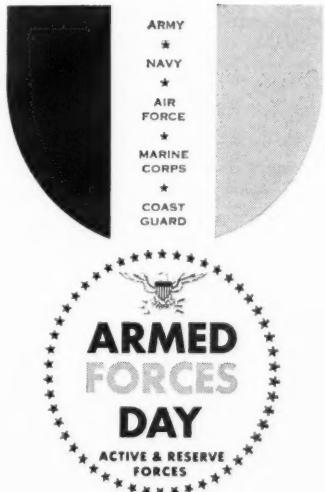
The AUSA will conduct a fund raising campaign for the proposed museum during June, with voluntary contributions asked from members of the Army, Army National Guard and Army Reserve Components.

Funds may be sent to the Treasurer, AUSA, 1529 Eighteenth Street N.W., Washington 6, D. C. who will maintain separate custody of them under direction of the Council of Trustees of the Association.

PLANS for construction of a memorial museum to commemorate founding of the United States Army at Independence Hall in Philadelphia on 14 June 1775 have been announced by the Association of the United States Army.

# "Power For Peace" on Display

## In 1961 Armed Forces Day



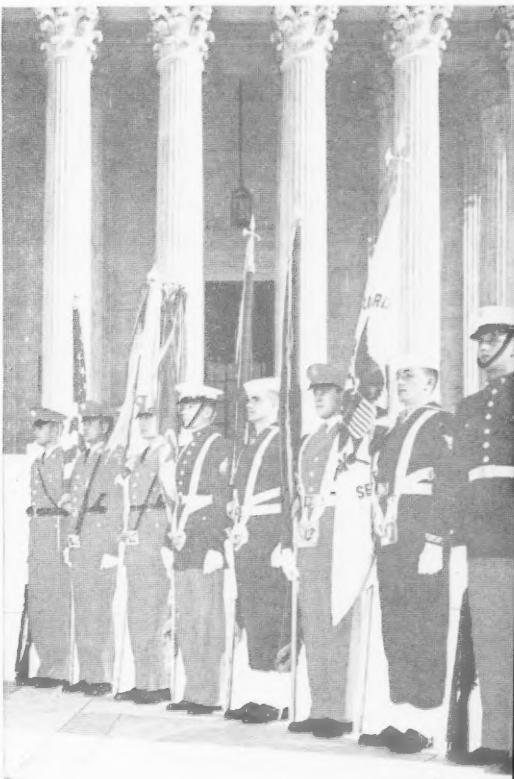
EMPHASIZING the role of the Armed Forces of the United States in safeguarding peace and freedom throughout the world, installations of the Army, Navy, Air Force, Marine Corps, Coast Guard and various Reserve Forces will open their gates to friends at home and abroad for Armed Forces Day observances during the third week in May.

From 13 to 21 May, there will be open house events, exercises, exhibits and demonstrations for civilian guests at Armed Forces installations worldwide. More than a thousand community programs in continental United States will feature parades, displays and demonstrations.

Prior to 1950, Army Day was celebrated on 6 April (the anniversary of the U. S. declaration of war in 1917), Air Force Day on 8 September, Navy Day on 27 October and the Marine Corps anniversary on 10 November. In April 1949 the Secretary of Defense announced consolidation of the four events into a single annual Armed Forces Day in line with creation of the Department of Defense. President Truman proclaimed the third Saturday in May 1950 as the first Armed Forces Day.

The celebration now is intended to symbolize unification and demonstrate the close working relationship among the services, and to give the public an annual report on the state of the Nation's defense.

Slogan for the celebration, staged wherever U. S. forces may be located throughout the world, again will be "Power for Peace." Last year about 24 million people attended the various programs while millions of others learned more about our national security through newspapers, magazines, radio, television and other news programs.



# POWER ON LAND

UNITED STATES  
**ARMY**

*...that this nation  
shall not perish."*

